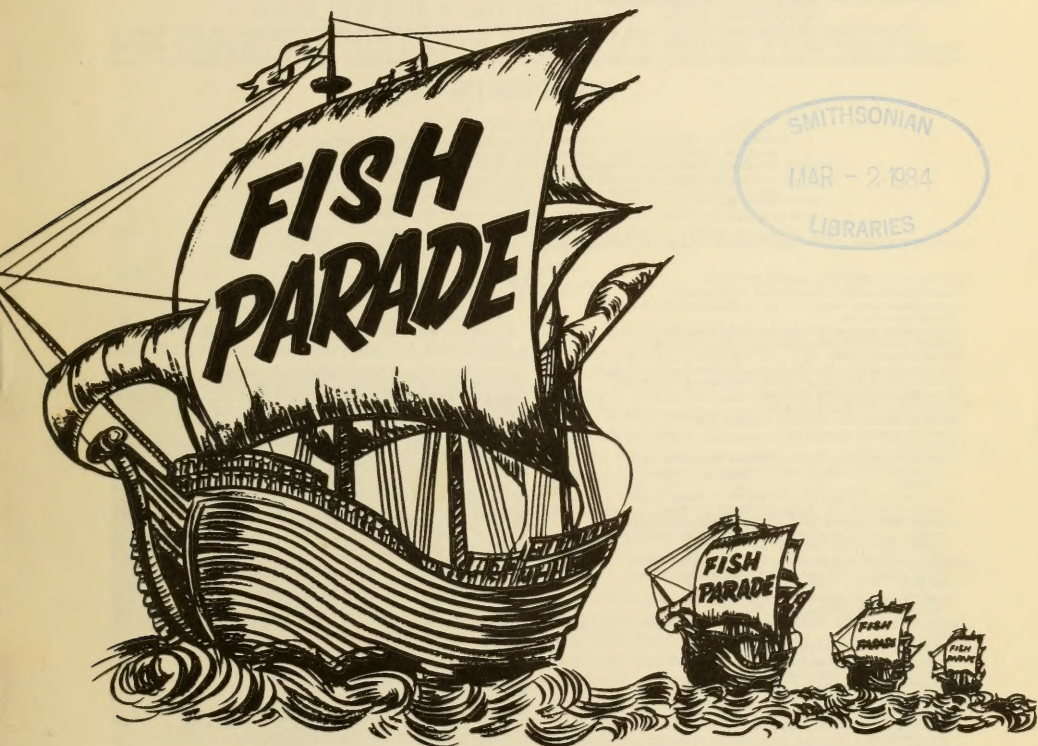


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COMMERCIAL FISHERIES REVIEW



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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor

J. Pileggi, Associate Editor

H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

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CONTENTS

COVER: The Fishing Industry's annual promotion for all domestic edible products around the theme "Fish Parade" is scheduled for September 18-28, 1957. This all-out promotion effort by the industry is expected to increase interest in and consumption of all types of fishery products. (See pp. 37 and 38, and outside backcover of this issue.)

Laboratory Method of Obtaining Unsaturated Fatty Alcohols from Fish Oils, by Edward H. Gruger, Jr.	Page 1
RESEARCH IN SERVICE LABORATORIES:	6
Discoloration in Precooked Tuna for Canning	6
Inspection Aid for Voluntary U. S. Standards for Frozen	6
Fried Fish Sticks	6
Frozen Fish Packaging Improvement Proposed	8
Revised and New Federal Specifications Planned for	8
Five Fishery Items	8
Technical Note No. 40 - Experimental Mobile De-Icing,	9
Washing, and Weighing Unit for Unloading Fish from	9
Vessels, by Joseph W. Slavin	9
TRENDS AND DEVELOPMENTS:	11
American Fisheries Advisory Committee:	11
New Committee Appointed	11
California:	11
Abundance and Life History Data on Ocean Shrimp	12
Gathered Off California (M/V Nautilus Cruise	12
57-N-2)	12
Escapement of Immature Shrimp from Beam Trawls	12
Studied (M/V N. B. Scofield Cruise 57-B-1)	12
Pelagic Fish Schools Surveyed by Airplane Off Southern	13
California Coast (Cessna 1359D, May 14-23; and	13
Beechcraft 4758N, May 15-17)	13
Oceanographic and Biological Observations (M/V	14
Black Douglas Cruise 57-3-B and Orca Cruise	14
57-3-0)	14
Tuna Tagged Off Mexico, Central America, and	15
Ecuador (M/V Challenger, 57-C-1)	15
Cans--Shipments for Fishery Products, January-April	16
1957	16
Federal Purchases of Fishery Products:	16
Department of Defense Purchases, June 1957	16
Shrimp Purchase Description Revised	16
Fish and Wildlife Advisory Group Meets	18
Fisheries Loan Fund	18
Freezing Fish at Sea:	20
Service Inaugurates Engineering Study of Trawler-	20
Freezer Ship	20
Gulf Exploratory Fishery Program:	21
Trawling Gear To Be Tried in Red Snapper Fishery	21
Interior Department Approves Proposal to Study Effect	21
of Pesticides on Fish and Wildlife	21
Irradiated Food--Commercial Production	22
1950	22
Japanese Fishery Officials Confer with U. S. Fish and	24
Wildlife Service	24
Maine:	24
Canned Sardines Promoted by Boy Scouts at Jamboree	24
Sardine Council Launches Summer Advertising Cam-	25
paign	25
Maine Sardines:	25
Canned Stock: June 1, 1957	26
Market Outlook for Fishery Products	26
New York:	26
Advisory Committee Appointed to Study Marine Sport	26
and Commercial Fishing	26
North Atlantic Fisheries Exploration and Gear Research:	27
Experimental Long-Line Tuna Trip Successful (M/V	27
Delaware Cruise 57-5)	27
North Atlantic Fishery Investigations:	29
Efficiency of Scallop Dredges with Different Size Rings	29
Studied (M/V Whaling City, June 13-23)	29
TRENDS AND DEVELOPMENTS (Contd.):	29
North Atlantic Fishery Investigations (Contd.):	29
Fish Behavior in Cod Ends Studied with Underwater	29
Television (M/V Albatross III Cruise 96	29
Vessel Licenses For Use of Small-Mesh Cod End	31
Discontinued	31
Oregon:	31
Spring King Salmon Run in Columbia River Good	31
Oysters:	32
Long Island Sound Research Program for 1957	32
Pacific Oceanic Fishery Investigations:	33
Albacore Tuna Abundant Off Coasts of Oregon and	33
Washington	33
Skipjack Tagged Between Islands of Oahu and Hawaii	33
(M/V Charles H. Gilbert Cruise 33)	33
Skipjack Tuna Tagged Around Hawaiian Island of	34
Oahu (M/V John R. Manning Cruise 35)	34
More Skipjack Tagged in Hawaiian Area (M/V Hugh M.	36
Smith Cruise 39)	36
Promotion For Fishing Industry Will Stress "Fish	37
Parade" Theme	37
Salmon:	38
National Canned Salmon Week	38
Public Hearing on Proposed Protection of Spawning	38
Areas in Salmon River Drainage	38
Regulations For Indian Salmon Fishing on Columbia	39
River	39
Salmon Tagging in North Pacific to be Continued	39
Saltonstall-Kennedy Act Fisheries Projects:	40
Fishery Research Contracts Awarded	40
School-Lunch Program:	41
School-Lunch Program Workshops, Summer 1957	41
Shrimp:	42
Ice-Holding Units For Vessels	42
South Atlantic Exploratory Fishery Program:	42
Exploratory Deep-Water Shrimp Trawling Along South	42
Atlantic Coast (M/V Combat Cruise 8, April 18-June	42
June 4, 1957)	42
Carolina Coasts Surveyed For Deep-Water Shrimp	43
(M/V Combat Cruise 10, June 12-26, 1957)	43
Tuna:	44
Tagged Yellowfin Travels 900 Miles	44
U. S. Foreign Trade:	44
Edible Fishery Products, April 1957	44
Groundfish Fillet Imports, June 1957	45
Imports and Exports of Selected Fishery Products,	45
April 1957	45
Tuna Canned in Brine Imports Under Quota Proviso	46
Virginia:	46
Oyster Losses This Summer Predicted by Biologists	46
Upper Rappahannock River Has Advantages For	47
Oyster Planting	47
Wholesale Prices, June 1957	48
FOREIGN:	49
International:	49
World Fish Oil Exports Up Slightly in 1956	49
Yugoslavia and Canada Study Freezing Sardines Prior	49
to Canning	49
International Pacific Halibut Commission:	49
First Season in Areas 2 and 1B Closed	49

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LABORATORY METHOD OF OBTAINING UNSATURATED FATTY ALCOHOLS FROM FISH OILS

By Edward H. Gruger, Jr.*

PREFATORY ABSTRACT

A laboratory method of obtaining unsaturated fatty alcohols without the disadvantages of the conventional sodium-reduction process was worked out for fish-oil fatty acids. This method involves the use of lithium aluminum hydride. A combination of low-temperature crystallization and urea-complexing provides the best practical means of obtaining these highly unsaturated fractions, with a minimum of molecular change. These techniques are needed in the development of new industrial products from fish oils.

BACKGROUND

Research is being conducted on fish oils at the Service's Seattle Technological Laboratory for the purpose of developing new industrial products. In the past there has been very little work on the development of such products from fish oils. About three years ago, need for more research of this nature became evident because of a downward trend in fish-oil consumption.

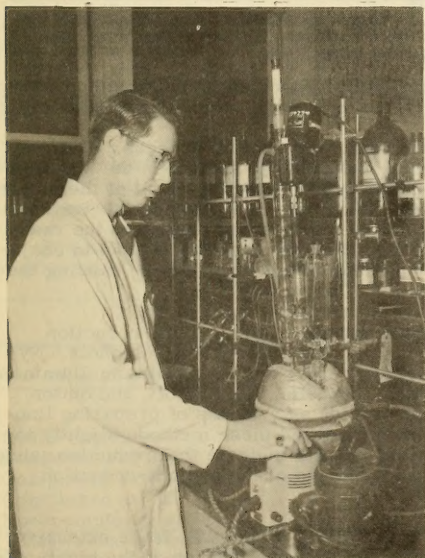


Fig. 1 - Apparatus for carrying out sodium-reduction of triglycerides of fish oils, Seattle Technological Laboratory, Seattle, Wash.

Fish oils contain fatty-acid constituents that are different from those in animal and vegetable oils in two respects. First, the fatty acids of fish oils have, on the average, molecules of longer chain lengths than have the other common commercial oils. Second and more important, the fish-oil fatty-acid molecules have a greater concentration of highly unsaturated constituents than have the other common oils. This high unsaturation is unique in that it constitutes 4 to 6 carbon-atom-to-carbon-atom double bonds, as compared to 2 to 3 double bonds in other oils.

In the development of new products, the question is: what aspect of these unique compounds can best be utilized? In other words, (1) should the high degree of unsaturation of the oils be used to obtain products that cannot be prepared from other commercial oils or (2) should

*Chemist, Fishery Technological Laboratory, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, Seattle, Wash.

products be developed that possess the available high degree of unsaturation of the oils? Epoxy fatty acids, which contain no unsaturation, are an example of a product that results from using the unsaturation to produce it. Polyunsaturated fatty alcohols are an example of the other type of product in which the unsaturation is maintained.

Much of the research carried on at the Seattle laboratory has been of this latter type, the thinking being that products from fish oils that maintain the high degree of unsaturation will help add to a technology based on polyunsaturation. Many of our paints and lacquers rely on polymerization through unsaturation of this kind for their film-forming properties. It is quite possible that desirable properties can be obtained through the presence of carbon-to-carbon unsaturation as well as of other functional chemical groups.

NATURE OF EXPERIMENTAL WORK

POLYUNSATURATED FATTY ALCOHOLS: Polyunsaturated fatty alcohols have been given considerable attention in this laboratory. The fatty alcohols are intended to serve as a link or an intermediate to the production of many possible derivatives. Initial work in this study was reported by Gruger (1957). A method that was developed by Pryde (1951) for the sodium reduction of menhaden oil was carried out on methyl esters of pure fatty acids to produce the corresponding fatty alcohols. This method was subsequently applied at this laboratory to the natural triglycerides of sardine oil.



Fig. 2 - Simultaneous hydrolysis and steam distillation of sodium-reduction products of triglycerides, Seattle Technological Laboratory, Seattle, Wash.

Several disadvantages were noted in the sodium-reduction process. The reaction required high temperatures in order to maintain the sodium in the required molten state. This high temperature was conducive to rearrangement of the double bonds in the resulting fatty alcohols, besides aiding oxidation and polymerization. Furthermore, the presence of a strongly alkaline mixture contributed to the rearrangement of the double bonds. This rearrangement, in most cases, lead to conjugated double bonds, which in turn produced an unstable system, thereby causing the products to polymerize readily in the presence of oxygen.

We are attempting to overcome the disadvantages of the sodium-reduction process by using another method of producing polyunsaturated fatty alcohols. Nyström and Brown (1947) were among the first to report the use of lithium aluminum hydride for the reduction of carboxylic acids. Ligthelm, von Rudloff, and Sutton (1950) reported the use of lithium aluminum hydride as a means of preparing linolenyl alcohol from methyl linolenate. We have modified these methods slightly to apply to fish-oil fatty acids and esters. Initial results indicate that reduction using lithium aluminum hydride overcome the disadvantages of the sodium-reduction process.

SEPARATION METHODS APPLIED TO FATTY ALCOHOLS: More extensive, however, has been the work relating to separation and purification of the highly unsaturated fatty alcohols derived from fish oil. These separations were studied for the purpose of finding the best means for concentrating the highly unsaturated fatty

alcohols that possess tetraene, pentaene, and hexaene structures. Much attention was given to low-temperature fractional crystallization, fractionation of urea-inclusion compounds, and fractional distillations at reduced pressures.

The low-temperature fractional crystallization of the fatty alcohols was carried out at room temperature, 0°C ., and -25°C ., employing acetone as the solvent. A ratio of 10:1 (volume to weight) of acetone to fatty alcohols was used. An addi-

Table 1 - Analytical Results of Some Low-Temperature-Fractionated Sardine-Oil Fatty Alcohols ^{1/}

Fraction	Weight	Yield	Iodine Value	Refractive	Acid
	<u>Grams</u>	<u>Percent</u>	(Wijs)	Index	Value
				$\frac{30}{n_D}$	
Destearinated sardine oil	300.0	-	197.7	1.4782	175.4 ^{2/}
Crude fatty alcohols ...	243.7	100.0	191.6	1.4738	19.2
Fatty alcohols from -5°C . precipitate	44.4 ^{4/}	18.2	137.1	1.4511 ^{3/}	13.5
Fatty alcohols from -25°C . precipitate ...	61.5 ^{4/}	25.3	119.6	1.4485	12.8
Fatty alcohols from -25°C . filtrate	137.6 ^{4/}	-	235.2	1.4803	22.8
Fatty alcohols from -70°C . precipitate ...	77.2 ^{4/}	31.7	197.6	1.4748	-
Fatty alcohols from -70°C . filtrate	43.4 ^{4/}	17.8	300.8	1.4930	-
^{1/} Fatty alcohols prepared by a sodium reduction process.			^{3/} Measured at 70°C .		
^{2/} Saponification value.			^{4/} Weights based on 243.7 grams crude alcohols. (The actual weight of crude alcohols fractionated was 200 grams.)		

tional fractionation was studied at -70°C . (dry ice in acetone) using a 5:1 (volume to weight) ratio of methanol to fatty alcohols. The data shown in table 1 were obtained using this method for fractionating the unsaturated fatty alcohols.

Fractionation of urea-inclusion compounds, a relatively new technique, was investigated in our laboratory by Domart, Miyauchi, and Sumerwell (1955). By ap-

Table 2 - Analytical Results of Fatty Alcohols Fractionated as Urea-Inclusion Compounds

Alcohol Fraction	Weight	Yield ^{1/}	Iodine Value	Refractive
	<u>Grams</u>	<u>Percent</u>	(Wijs)	Index
				$\frac{30}{n_D}$
Crude mixture	150.0	100.0	190.1	1.4722
Complexed at 20°C	36.4	24.3	25.8	(solid)
Complexed at 0°C	33.2	22.8	91.4	1.4569
Complexed at -25°C	7.7	5.1	211.8	1.4735
Non-complexed at -25°C	58.5	39.0	286.1	1.4969
^{1/} Lower yields than expected--should be quantitative.				

plying the findings of Domart and his coworkers to fatty-alcohol mixtures, we were provided with an additional tool for performing the necessary separations.

The best method thus far developed for separating the fatty alcohols by this technique is as follows: The fatty alcohols are dissolved in a solution of methanol containing 16.6 grams of urea per 100 milliliters of methanol. A 14:1 mole ratio of urea to fatty alcohols is used. The mixture is heated and stirred until it forms a clear solution. The solution is allowed to stand at room temperature until precipitation of the urea-inclusion compounds (urea-complexes) is complete. (This usually required 8 to 16 hours.) The solid complexes are removed by filtration, and the remaining filtrate then is cooled to the next lower temperature, in this case 0° C. The process of cooling and filtering is repeated at 0° C. and at -25° C. The precipitated complex fractions are extracted with petroleum ether (b.p. 30° to 60° C.) to remove the fatty alcohols. The filtrate from the precipitation at -25° C. is evaporated nearly to dryness and then is extracted with petroleum ether. Table 2 shows some analytical results of fatty alcohols separated by this method.

A separation study was carried out using a combination of low-temperature crystallization and fractionation of urea-complexes. Table 3 shows analytical re-

Fraction	Weight	Yield	Iodine Value (Wijs)	Refractive Index
	Grams	Percent		n_D^{30}
Alcohol mixture ^{1/}	31.5	100.0	300.8	1.4930
Alcohols from combined precipitated complexes	10.2	32.4	233.9	1.4822
Alcohols from final 0° C. filtrate	18.2	57.8	345.7	1.5009

^{1/} See table 1 for fraction from -70° C. filtrate.

sults of a urea-complex separation applied to fatty alcohols soluble in methanol at -70° C. (the final fraction shown in table 1). The urea-complexing was terminated at 0° C., and the precipitated urea-complex fractions were combined. Using this combination of methods of separation, we obtained polyunsaturated fatty alcohols having a preponderance of four to six double bonds.

Some work has been carried out in fractionally distilling polyunsaturated fatty alcohols at reduced pressures. These pressures have ranged from 0.8 to 1.0 millimeters of mercury, which are about the lowest pressures for operating conventional distillation apparatus for good fractionation. In spite of performing the distilla-

Fraction	Boiling Point	Pressure	Volume	Refractive Index	Wijs Iodine Value ^{1/}
	Degrees C.	Mn. Hg	Ml.	n_D^{30}	
Pot charge	-	-	15.0	1.4921	294
A	119°-125°	1.0	1.02	1.4593	150
B	125°-138°	1.0	0.52	1.4631	180
C	138°-145°	1.5	1.14	1.4681	204
D	145°-149°	1.2	1.60	1.4798	265
E	149°-159°	1.2	0.62	1.4924	303
F	159°-162°	1.2	0.74	1.4969	323
G	162°	1.0	0.87	1.4972	253

^{1/} Approximate iodine values, owing to too small a sample to permit more than one determination.

tions in an inert atmosphere of pure nitrogen, we obtained yields of the order of 40 percent. Much polymerization occurs, with ultimate destruction of the highly unsaturated species, as is shown in table 4 by the poor yield.

If distillation techniques are to be used for separating and purifying polyunsaturated fatty alcohols, a multiple molecular distillation, performed at about 0.01 to 0.00001 mm. Hg., would have to be used in conjunction with one or both of the other two separation methods mentioned above. The low pressures are needed to prevent undue losses caused by polymerization from heating.

OTHER WORK: In addition to this work on fatty alcohols, similar work is being carried out on unsaturated fatty aldehydes, sulfur-containing fatty acids, fatty amines, and quaternary ammonium salts. A recent article (Gruger 1957) describes some of these preliminary studies. In the near future, chemical reactions will be studied involving the addition of various substituents to the unsaturation. This type of reaction, mentioned earlier, will give products free of unsaturation and, accordingly, will not have the unstable character found in derivatives possessing a high degree of unsaturation.

SUMMARY

The sodium reduction process of preparing highly unsaturated fatty alcohols from fish oils has several disadvantages that appear to be overcome by the lithium aluminum hydride reduction process. A means of obtaining highly unsaturated fatty alcohols in concentrated form has best been effected by using low-temperature fractional crystallization followed by fractionation of urea-inclusion compounds. Fractional distillations, performed at about 1.0 millimeter mercury pressure, are not successful for collecting higher unsaturated fatty alcohols. The low yields caused by polymerization indicate that in order to distill polyunsaturated fatty alcohols, one must distill at pressures nearer to those for molecular distillations. Other derivatives are being studied in a similar manner as for the fatty alcohols.

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DISCOLORATION IN PRECOOKED TUNA FOR CANNING

The development of off-colors in tuna meat during precooking is a tuna cannery problem which is economically significant. Although these off-colors vary from green to shades of tan and brown, the popular term to describe this condition is "green tuna." Because it is difficult or impossible to predict which fish will develop off-colors, a considerable amount of money is invested in these fish before they are discarded. Studies have shown the nature of the pink pigment normal to canned tuna meat and have led to means for preventing discoloration.

In August 1955, the U. S. Fish and Wildlife Service initiated work on this problem. The approach was first to identify the chemical compounds that produce the desirable pink pigment that is characteristic of good-quality precooked tuna and then the off-color pigments of green tuna.

Results of experiments leading to the identification of the desirable pink pigment are presented in a paper entitled "Identification of Pink Pigment of Canned Tuna" by Brown and Tappel in the March-April 1957 issue of *Food Research*. This work was supported by funds made available through the Saltonstall-Kennedy Act of 1954 and was administered collaboratively by the Service's Seattle Fishery Technological Laboratory and the University of California.

Brown and Tappel's studies of the properties of the pigment causing the desirable pink color of precooked and canned tuna show that the pigment is hemochrome. Their studies also indicate that the hemochrome is derived from the reaction heme of myoglobin and residual hemoglobin with either denatured globin or nicotinamide, or with both. The pink pigment in canned tuna can be stabilized by the proper addition of hemochrome-forming compounds and reducing agents.

The second phase of the investigation into the cause of discoloration or "greening" of precooked tuna was to study the nature of the pigments causing this condition. The laboratory investigations of this phase of the problem have been completed. The results of this part of the investigation, including recommendations for preventing the development of off-colors in canned tuna, are being prepared for publication and will be released within a short time.



INSPECTION AID FOR VOLUNTARY U. S. STANDARDS FOR FROZEN FRIED FISH STICKS RELEASED

The Bureau of Commercial Fisheries on June 12, 1957, released an Inspection Aid for frozen fried fish sticks. This Aid is designed to familiarize any one interested with the use of the voluntary U. S. standards for grades of frozen fish sticks. It will enable the interested party to use the standards as a quality-control tool in the plant or to assess the quality of frozen fried fish sticks delivered as being in accordance with the requirements for a certain grade.

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

INSPECTION AID No. 27

FROZEN FRIED FISH STICKS - GUIDE FOR MAKING DEDUCTIONS

SUB-FACTOR		NO. OF POINTS TO BE DEDUCTED		
		APPEARANCE MAXIMUM 35	DEFECTS MAXIMUM 40	CHARACTER MAXIMUM 25
FROZEN STICKS	CONDITION OF PACKAGED STICKS	Little deterioration or disorder Slight deterioration or disorder Moderate deterioration or disorder Excessive deterioration or disorder		0 1 2 3
	STICKS SEPARATE	Easily With slight to moderate pressure and no damage to coating With slight damage to coating With pressure and moderate damage to coating With difficulty and serious damage to coating		0 1-2 3-4 5-8 9
	BROKEN STICKS	None 10 percent More than 10 percent	0 7 14	
	DAMAGED STICKS	None 10 percent 20 percent 30 percent More than 30 percent	0 1-3 4-6 7-13 14	
	UNIFORMITY OF SIZE AND SHAPE	No non-uniform sticks 10 percent 20 percent 30 percent 40 percent 50 percent 60 percent 70 percent More than 70 percent	0 1-2 2-4 3-7 5-11 8-15 11-15 13-15 15	
	CONTINUITY OF COATING	No sticks showing breaks in coating 10 percent 20 percent 30 percent 40 percent 50 percent 60 percent 70 percent More than 70 percent	0 1-2 2-4 3-6 4-8 5-10 7-10 9-10 10	
	COLOR	No sticks deviating from uniform color 10 percent 20 percent 30 percent 40 percent More than 40 percent	0 0-1 1-3 2-5 4-8 7-10	
	FREE OIL IN COOKING UTENSIL	None Slight amount of free oil Excessive free oil		0 1-3 5
	ADHERENCE OF COATING	No sticks showing swelling or ridging of coating 10 percent 20 percent 30 percent 40 percent 50 percent 60 percent 70 percent More than 70 percent		0 0-1 1-3 2-5 4-6 7-10 8-10 9-10 10
	DAMAGE BY HANDLING	None Slight Moderate Excessive		0 1 3 5
	OILINESS OF BREADING	None Slight Moderate Excessive		0 1 2 3
	TEXTURE OF COATING	Firm not tough, pasty or mushy Slightly tough, pasty or mushy Moderately tough, pasty or mushy Highly tough, pasty or mushy		0 1 2 3
	TEXTURE OF FLESH	Firm but tender and moist Slightly tough, dry and/or fibrous or mushy Moderately tough, dry and/or fibrous Excessively tough, dry and/or fibrous		0 1 3 5
	BLEMISHES	Blood spots, bruises, curd spots, burned material Carbon specks (small 1 point, large 2 points)	1-2 1-2	
	SERIOUS BLEMISHES	None 10 percent More than 10 percent	0 7 14	
	BONES	None Occurrence in 10 percent of sticks 20 percent More than 20 percent	0 5 10 14	

The basic policy of the Bureau of Commercial Fisheries in encouraging the development and promulgation of voluntary U. S. standards for grades of fishery products has been to make available a single official nationwide and uniform system of quality evaluation for each of the important fishery products. Such a system will do much to stabilize the market, and elevate the quality of the fishery product concerned.

The Aid lists the various factors which detract from the quality of the fish sticks and the relative importance of each. The points deducted for increasingly severe defects are tabulated.

Frozen Fried Fish Sticks--Guide to Making Deductions, Inspection Aid No. 27 was prepared by the Department of Agriculture from data supplied by the Department of the Interior's Bureau of Commercial Fisheries. Together with the official voluntary U. S. standards for grades of frozen fried fish sticks, the Aid forms a complete system for evaluation of a product as to quality.



FROZEN FISH PACKAGING IMPROVEMENT PROPOSED

During a recent meeting of industry members and Service technologists, held at the Bureau of Commercial Fisheries Seattle Technological Laboratory, there was general agreement that much of the variable quality of frozen fish steaks, as sometimes found in the retail cabinets, is due to factors beyond the complete control of the original packer. It was felt that development of better packaging procedures promises to be the only effective means of increasing the processor's control of quality in his product throughout the distribution chain.

Improved techniques would be required to hold oxidation and dehydration of the product to an absolute minimum regardless of the undesirable temperatures and poor handling which the product might suffer during distribution and marketing. If

such a safety factor could be built into the product through the use of "ideal" packaging materials and special application techniques, progress would be made in protecting the products from the unavoidable stresses encountered in the marketing chain.

Changes in basic packaging techniques are costly. The value of a given technique and its commercial practicability must be demonstrated before it can be adopted by the industry. For this reason, the problems involved in accomplishing the necessary investigations of the many packaging processes were discussed. The industry members recommended that the Service undertake cooperative studies with the industry in this vital field of research.



REVISED AND NEW FEDERAL SPECIFICATIONS PLANNED FOR FIVE FISHERY ITEMS

During a recent conference of members of Federal agencies and the Department of Defense, the various services established relative priorities for all previously requested and desired Federal product specification actions. Definite completion action was requested on five Federal specifications between now and the end of fiscal year 1959. These specifications are as follows: (1) Fish, Fresh (chilled) and Frozen, PP-F-381, revision; (2) Tuna Fish, Canned, PP-T-771, revision; (3) Clams, Canned, new specification; (4) Lobsters, Live; Chilled and Frozen Meat, new specification; and (5) Scallops, Chilled and frozen, revision and conversion of present applicable military specification to Federal specification.

The proposed final draft of the Federal specification for Shrimp, Frozen, Raw: Breaded (PP-S-315) has been prepared in accordance with comments from Federal agencies concerned and industry. Prior to formal promulgation of the specification, a first-hand in-plant evaluation of the requirements of the specification is being made in terms of commercial practicability with due consideration given to Federal procurement needs.



TECHNICAL NOTE NO. 40 - EXPERIMENTAL MOBILE DE-ICING, WASHING, AND WEIGHING UNIT FOR UNLOADING FISH FROM VESSELS

ABSTRACT

THE DESIGN OF AN EXPERIMENTAL MOBILE FISH DE-ICING, WASHING, AND WEIGHING UNIT FOR UNLOADING GROUND FISH FROM A FISHING VESSEL IN NEW ENGLAND IS DESCRIBED. THE EXPERIMENTAL UNIT CONSISTS OF A WOODEN UNLOADING PLATFORM, A RECEIVING HOPPER, A COMBINATION DE-ICER AND WASHER, A CONVEYOR, A WEIGHING HOPPER, AND A SCALE--ALL MOUNTED ON A STEEL FRAME SUPPORTED ON WHEELS.

BACKGROUND

The design and development of mechanical equipment that will promote efficient and sanitary handling of fishery products is one of the projects of the Bureau of Commercial Fisheries in East Boston, Mass. As a part of this project, a mobile fish de-icing, washing, and weighing unit for unloading New England groundfish (haddock, ocean perch, cod, etc.) from a fishing vessel has been designed. After the design has been criticized for possible improvement, the unit will be constructed.

DESCRIPTION OF EQUIPMENT

The mobile de-icing, washing, and weighing unit (fig. 1) consists of a steel frame mounted on eight rubber-tired swivel casters. Attached to this frame is a

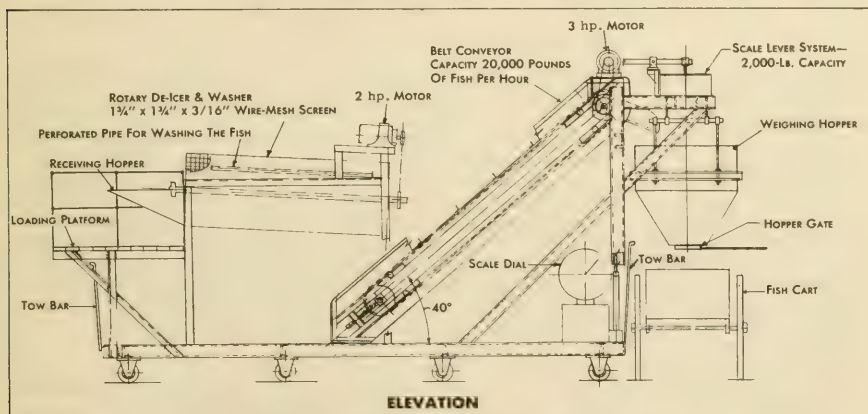


FIG. 1 - MOBILE FISH DE-ICING, WASHING, AND WEIGHING UNIT.

wooden loading platform, a receiving hopper, a rotating cylindrical screen-type de-icer and washer, a conveyor, and a weighing hopper connected to an automatic moistureproof scale.

DE-ICER AND WASHER: The combination de-icer and washer is somewhat similar to those used in the ocean perch fishery. It consists of a rotating screen 8 feet in length and 3 feet in diameter. The screen is made of $\frac{3}{16}$ -inch diameter wire mesh, suitably reinforced and having openings $1\frac{1}{4}$ inches square. Water, flowing through a $1\frac{1}{2}$ -inch diameter pipe perforated along the bottom and located within the upper half of the rotating cylindrical screen, provides for the washing of the fish. Power for the rotation of the screen is provided by a 2 hp. electric motor.

NOTE: PLANS FOR THIS UNIT MAY BE OBTAINED FROM THE FISHERY TECHNOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, 61 SUMNER ST., EAST BOSTON, MASS. INTERESTED PERSONS ARE INVITED TO SEND THEIR COMMENTS DIRECTLY TO THE LABORATORY OR TO VISIT THE LABORATORY AND DISCUSS THE UNIT FIRST-HAND.

CONVEYOR: The conveyor is of a galvanized metal-belt type having a rated continuous capacity of 20,000 pounds of fish an hour. The belt is 3 feet wide, has galvanized angle-iron flights attached transversely at 2-foot intervals, and is designed to operate at a speed of 260 feet a minute. The conveyor is driven by a 3 hp. electric motor.

WEIGHING HOPPER: The weighing hopper has a calculated holding capacity of 2,300 pounds of fish and is of galvanized metal suitably reinforced. The hopper is suspended from an enclosed lever system. A manually-operated gate in the bottom of the hopper enables the operator to dump the fish from the hopper into a cart or box.

SCALE: The scale consists of an enclosed lever system located over the weighing hopper and connected to a moistureproof direct-reading indicating dial. The housing for the dial contains an automatic cut-off switch and an electric heating element, which maintains the dial at the proper operating temperature in cold weather.

The cutoff switch is connected to the control switches for the conveyor motor and the de-icer motor in such a manner that when the desired weight is reached (weight at which cut-off switch is set), the operation of the conveyor and the de-icer is stopped. A manual reset button is provided to re-start the conveyor and de-icer motors after the fish in the hopper are dumped. The cutoff switch can be manually set to stop the conveyor and de-icer motors at any desired hopper weight within the 2,000-pound capacity of the scale.

DESCRIPTION OF OPERATION

The operation of the unit is as follows: The fish in the hold of the vessel are put into baskets having a capacity of 100 to 150 pounds each. The basket, which ordinarily contains some ice along with the fish, is swung from the vessel to a man standing on the loading platform, who empties the basket into the receiving hopper. The fish and ice move from the hopper into the de-icer and washer. The ice is separated (by breaking into small pieces and falling through the wide mesh in the rotating screen) and the fish are washed. The fish then drop onto the belt conveyor, which carries them up to the chute, which directs them into the weighing hopper. When the weight of the fish in the hopper reaches the point at which the scale cutoff switch has been set, the conveyor and de-icer automatically stops. The operator reads the weight, records it, and opens the hopper gate, allowing the fish to drop into a cart or box. When the hopper is empty, the operator closes the gate and pushes a reset button to start up the de-icer and conveyor motors. The cycle of operation then is repeated.

--BY JOSEPH W. SLAVIN, REFRIGERATION ENGINEER,
FISHERY TECHNOLOGICAL LABORATORY,
BUREAU OF COMMERCIAL FISHERIES,
EAST BOSTON, MASS.





TRENDS AND DEVELOPMENTS

American Fisheries Advisory Committee

NEW COMMITTEE APPOINTED: Letters of appointment to varying terms of office in the American Fisheries Advisory Committee were mailed to 19 members of all segments of the American fishing industry, the Secretary of the Interior announced on June 22.

This Committee was authorized by the Saltonstall-Kennedy Act of 1954 which was passed by the Congress "to promote the free flow of domestically produced fishery products in commerce." The Act was due to expire on June 30, 1957, which would have automatically terminated the Committee.

With the passage of the Fish and Wildlife Act of 1956 which, among other things, made the Saltonstall-Kennedy Act permanent, the Department of the Interior has now established a new committee using a staggered-term system which will retire one-third of the committee each year.

Under this plan 13 former members are being reappointed effective July 1--five for one year, four for two years, and four for three years. Six new members are being appointed to complete the committee.

This group represents a complete cross-section of the American fishing industry. Geographically, it provides representation from the Atlantic, Gulf, and Pacific Coasts, and the inland States.

Former members reappointed and their terms of offices are as follows: For one year: Moses B. Pike, Treasurer, Holmes Packing Corp., Eastport, Me.; H. F. Sahlman, Sahlman Sea Foods, Fernandina Beach, Fla.; Donald P. Loker, Vice Pres., Star-Kist Foods, Inc., Terminal Island, Calif.; Lawrence Calvert, Pres., San Juan Fishing and Packing Company, Seattle 14, Wash.; Arthur Sivertson, Sivertson Bros. Fisheries, Duluth, Minn. For two years: J. Richards Nelson, Oyster and Clam Grower, Madison, Conn.; David H. Hart, Fisherman and Vessel Owner, Cape May, N. J.; Lawrence W. Strasburger, Strasburger Inspection Service, Metairie, La.; Thomas F. Sandoz, Pres., Columbia River Packers Assn., Astoria, Ore. For three years: James S. Carlson, Treasurer, Baker, Boies and Watson Co., Boston 10, Mass.; Leon S. Kenny, President, Pinellas Seafood Co., St. Petersburg 5, Fla.; Arthur H. Mendonca, President, F. E. Booth, Inc., San Francisco, Calif.; Chris Dahl, Kayler-Dahl Fish Company, Petersburg, Alaska.

New members and terms of office are: For one year: John Lewis, President, Twin City Fishermen's Cooperative Assn., Inc., Morgan City, La. For two years: William Ballard, President, Ballard Fish & Oyster Co., Inc., Norfolk, Va.; Mason Case, Manager, Fishermen's Coop. Assn. of San Pedro, San Pedro, Calif. For three years: Ralph E. Carr, President, Mid Central Fish Co., Kansas City, Mo.; R. L. Haynie, President, Reedville Oil & Guano Co., Inc., Reedville, Va.; James McPhillips, President, McPhillips Packing Corp., Mobile, Ala.

"The American Fisheries Advisory Committee has rendered invaluable service to this Department in carrying out its responsibilities under the law," Secretary Seaton said, "and with these new appointments the Department will continue to benefit from the advice available from people with long experience in the commercial fishing industry."

The American Fisheries Advisory Committee has so far held five meetings. The next meeting was scheduled to be held in Ketchikan and Juneau, Alaska, July 22-25. Assistant Secretary of the Interior for Fish and Wildlife Ross Leffler is Chairman of the Committee and was expected to preside at the Alaska meeting.

The law makes available to the Secretary of the Interior each fiscal year an amount equal to 30 percent of the gross receipts from customs duties collected on imported fishery products for the conduct of various types of fishery research and services to develop and increase markets for fishery products of domestic origin. With these funds the Bureau of Commercial Fisheries conducts a broad program designed to aid the American fishing industry.



California

ABUNDANCE AND LIFE HISTORY DATA ON OCEAN SHRIMP GATHERED OFF CALIFORNIA (M/V Nautilus Cruise 57-N-2): As a result of abundance and life history data gathered on this cruise by the California Department of Fish and Game's research vessel Nautilus and the N. B. Scofield, Cruise 57-B-1, it was recommended that Area C (Avila shrimp bed, between Point Pigeon and Point Rincon) be re-opened to commercial shrimp fishing. During the cruise (January 16-March 8, 1957), 61 tows were made with an 8-foot beam trawl--48 tows contained ocean shrimp (Pandalus jordani). Tows ranged in depth from 39-165 fathoms. The better catches originated in depths of 110-125 fathoms.

Seven tows were made with a 20-foot beam trawl, of which three of these contained commercial quantities of shrimp. Strong currents coupled with large swells considerably hampered the fishing efficiency of the 20-foot gear.

The trawling "A" frame was modified with protective pipe skids. This greatly facilitated retrieving the 20-foot beam in rough weather and also made the trawling operation much safer.

* * * * *

ESCAPEMENT OF IMMATURE SHRIMP FROM BEAM TRAWLS STUDIED (M/V N. B. Scofield Cruise 57-B-1): This cruise of the California Department of Fish and Game's research vessel N. B. Scofield off the mouth of the Russian River and off Avila was designed to test the escapement of immature shrimp from beam trawls of various mesh sizes.

During the cruise (February 15-March 18, 1957), 68 drags were made using a double cod end or "trousers trawl." A trousers trawl consists of two 10-foot wide trawl nets attached from the same 20-foot beam. Measurements of the catches from pairs of nets of different mesh show the escapement factor.

Bad weather hampered fishing operations off the Russian River area. Net tests were completed off the Avila area where shrimp were located by the vessel Nautilus. In the course of mesh tests some 7,000 pounds of shrimp were taken in the comparison gear.

* * * * *

PELAGIC FISH SCHOOLS SURVEYED BY AIRPLANE OFF SOUTHERN CALIFORNIA COAST (Cessna 1359D, May 14-23; and Beechcraft 4758N, May 15-17): During an airplane spotting flight (57-2), observers aboard the aircraft found far fewer fish schools (except for yellowtail and sardines) in May this year than in the same month last year. The area surveyed by the California Department of Fish and Game's airplanes extended along the inshore California shore from Santa Cruz to San Diego and the area around Santa Cruz, Santa Rosa, San Miguel, Santa Catalina, San Clemente, and Coronados Islands.

The flight was designed (1) to assess the abundance and distribution of schooling pelagic fish and to measure variations in abundance of fish schools from day to day; and (2) to experiment with aerial photography in determining area of fish schools.

Weather conditions were quite variable. From May 16-19 exceptionally calm and clear weather prevailed over the entire coast. From May 20-23 strong winds and rain squalls were encountered.

Fish abundance was apparently affected by the various weather conditions

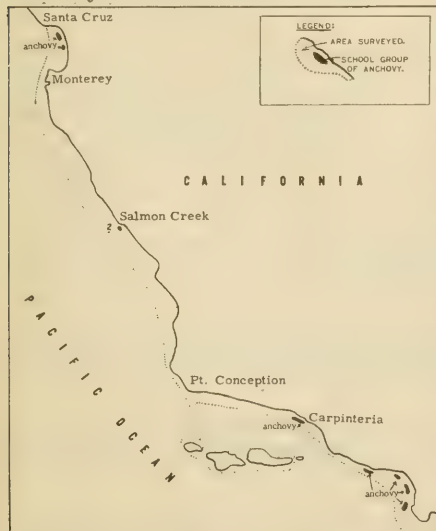


FIG. 2 - AIRPLANE SPOTTING FLIGHT 57-2 (MAY 15-23, 1957).

Few schools seen in the San Clemente area,

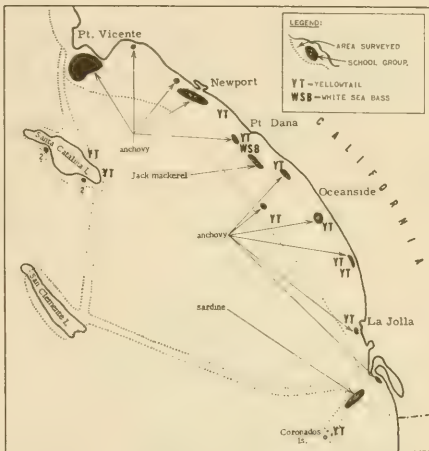


FIG. 1 - AIRPLANE SPOTTING FLIGHT 57-2 (MAY 14-23, 1957).

as the most fish schools were seen on the calm clear days.

Anchovy: The main concentration was between Pt. Vicente and Newport. This group of schools was mainly in the channel between the mainland and Santa Catalina Island but would at times come close to shore where it could be assessed by the Cessna. Up to 195 schools were seen in one day in this area whereas up to 3,000 schools were seen along the coast in May of 1956.

Sardine: One school group was seen between the Coronados Islands and Pt. Loma. These fish were nearly all of the 1955 year-class. (Determined from samples of live bait collected by U. S. Fish and Wildlife Service.)

Yellowtail: Far more were seen than on any other flight over the past three years. Large schools of this species were found from Newport and Santa Catalina Island to the Coronados.

Jack Mackerel: Fewer than last

OCEANOGRAPHIC AND BIOLOGICAL OBSERVATIONS^{1/} (M/V Black Douglas Cruise 57-3-B and Orca Cruise 57-3-0): Biological and hydrographic observations were made by the research vessels Orca of the Scripps Institution of Oceanography and the Black Douglas of the U. S. Fish and Wildlife Service South Pacific Fishery Investigations.

Orca (March 6-30, 1957): A total of 60 oblique plankton tows with a one-meter net were made to a depth of 140 meters, or less, in shallow water on each station off Southern California. Records were kept of black-footed albatross seen on day-light stations, as well as sauries and squid on night stations. Specimens were dip-netted when possible. The watch on the bridge kept a record of all marine mammals sighted. Pelagic observations were made while under way and at all stations.

Two Nansen bottles were lowered to 10 and 50 meters for salinity and temperature observations. Bathythermograph observations totaling 176 were taken at all station, and under way between stations and station lines, weather permitting. Also, 372 drift bottles were released at designated stations (12 per station). Other oceanographic observations were made.

Black Douglas (March 6-23, 1957): A total of 65 oblique plankton hauls were made, using a one-meter net, to a depth of 140 meters (except in shallow water) on each station off Southern California. This was accompanied by a 10- and 50-meter temperature and salinity sample.

STATION POSITIONS OF CALIFORNIA COOPERATIVE OCEANIC FISHERIES INVESTIGATIONS CRUISES; ORCA CRUISE 5703-0 AND BLACK DOUGLAS CRUISE 5703-B.

Bathythermograph observations were made at every station, every hour between stations, and station lines offshore, and every half hour from San Diego to the first station and between station lines inshore.

A continuous record of surface temperatures was kept by thermograph, and a continuous watch was kept for marine mammals. There were numbers of porpoise seen inshore and sperm whales and porpoise that defied identification offshore; also, killer whales were seen.

Pelagic observations were made every hour throughout the cruise. There were large numbers of pelagic crabs seen on all the southern stations. The northern part of the pattern showed pelagic life to be sparse.

Records were maintained on the numbers of black-footed albatross, saury, and squid seen on each station throughout the cruise. Squid were observed on about three stations and saury were seen on two stations. The largest number of saury seen was up in the hundreds; these were all small ones.

^{1/} CALIFORNIA COOPERATIVE OCEANIC FISHERIES INVESTIGATIONS.

All jig-line catches were recorded and stomachs were taken. We took three species of fish on the jig lines. They were yellowtail, yellowfin tuna, and bluefin tuna.

* * * * *

TUNA TAGGED OFF MEXICO, CENTRAL AMERICA, AND ECUADOR (M/V Challenger, 57-C-1): Biologists of the California Department of Fish and Game aboard the commercial tuna clipper Challenger tagged 603 yellowfin, skipjack, and big-eyed tuna during a trip that began on January 6 and ended April 25, 1957. The cruise was planned to (1) study the populations of the Eastern Pacific yellowfin, skipjack, and big-eyed tuna by tagging; (2) delineate the spawning range of the tuna varieties by nightlighting for tunalarvae; (3) make routine biological and limited oceanographic observations; (4) test the effect tag color may have on recovery success by alternating, in groups of five, red and blue tags with white tags; and (5) collect other marine organisms from bait and fishing areas. Tuna were tagged off Mexico, Clipperton Island, Cocos Island, Galapagos, Columbia, Ecuador, Costa Rica, Panama, Guatemala, El Salvador, and Nicaragua.



M/V CHALLENGER CRUISE 57-C-1, JAN. 6-APR. 25, 1957.

A total of 23 nightlight stations were occupied while the vessel drifted on the fishing grounds. Tuna-like larvae were discovered at one station off the coast of Mexico. In addition to nightlighting, other specimens of marine life were collected from bait and fishing areas.

Length-frequency samples were taken from a school of yellowfin tuna at Clipperton Island and from a school of skipjack in the Cocos Island area. Observations were made on size and species composition of schools from which fish were caught for tagging. Marine life sightings, which may be related to the occurrence of tunas, were taken as time permitted.

Daily weather was recorded throughout the cruise and surface sea temperatures were recorded every three hours for each 24-hour period. Tuna were captured in sea temperatures ranging from 19.8°C . - 31.2°C . (67.6°F . - 88.2°F .).

A new solid tagging needle was designed and fabricated from $\frac{3}{16}$ " stainless steel welding rod. The severity of all tag wounds was minimized and wound bleeding was eliminated when this needle was used.



Cans--Shipments for Fishery Products, January-April 1957



Total shipments of metal cans for fish and shellfish canning during January-April 1957 amounted to 29,767 short tons of steel (based on the amount of steel consumed in the manufacture of cans), compared to 23,094 short tons in the same period of 1956. Firms canning tuna, shrimp, oysters, Pacific mackerel, jack mackerel, and anchovies were active during the month. Packers of Maine sardines were preparing for the season that opened on April 15.

NOTE: STATISTICS COVER ALL COMMERCIAL AND CAPTIVE PLANTS KNOWN TO BE PRODUCING METAL CANS. REPORTED IN BASE BOXES OF STEEL CONSUMED IN THE MANUFACTURE OF CANS, THE DATA FOR FISHERY PRODUCTS ARE CONVERTED TO TONS OF STEEL BY USING THE FACTOR: 23.0 BASE BOXES OF STEEL EQUAL ONE SHORT TON OF STEEL.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JUNE 1957: Fresh and Frozen Fishery Products: A total of 2,023,000 pounds (valued at \$1,039,000) of fresh and frozen fishery products for the use of the Armed Forces were purchased in June 1957 by the Military Subsistence Market Centers. This was a decrease of 23.2 percent in quantity and 18.4 percent in value as compared with the previous month.

QUANTITY				VALUE			
June		Jan.-June		June		Jan.-June	
1957	1956	1957	1956	1957	1956	1957	1956
..	(1,000 Lbs.)	(\$1,000)
2,023	2,737	12,025	12,231	1,039	1,235	6,145	6,090

For the first 6 months of 1957 purchases totaled 12,025,000 pounds, valued at \$6,145,499--a decrease of 1.7 percent in quantity,

but higher by 0.9 percent in value as compared with the similar period in 1956.

Average prices paid for fresh and frozen fishery products in June 1957 averaged 51.4 cents a pound, somewhat higher than the 48.3 cents paid the previous month, and the 45.1 cents paid in the same month of 1956.

Canned Fishery Products: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during June 1957. During the first six months of 1957, purchases of canned tuna, salmon, and sardines were lower by about 17.2 percent as compared with the similar period in 1956.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, January-June 1957 with Comparisons

Canned Product	Quantity			
	June		Jan.-June	
	1957	1956	1957	1956
Tuna ..	263	1/	1,450	2,188
Salmon .	-	1/	992	601
Sardines	13	1/	86	227
Total .	276	1/	2,528	3,016
1/ UNAVAILABLE.				

NOTE: IN ADDITION TO THE PURCHASES OF FISHERY PRODUCTS REPORTED, SOME LOCAL PURCHASES ARE MADE WHICH ARE NOT INCLUDED. THEREFORE, ACTUAL PURCHASES ARE HIGHER THAN REPORTED.

* * * * *

SHRIMP PURCHASE DESCRIPTION REVISED: Effective with Notices of Intent to Purchase issued on and after June 17, 1957, and with resultant contracts, changes were announced to Purchase Description (BUSANDA) "Shrimp, Raw, Breaded, Frozen," dated August 1, 1952, and amendment dated November 20, 1953.

The changes, as announced by the Military Subsistence Supply Agency were issued in Headquarters Notice No. 14(57), were as follows:

1. The count of raw unpeeled shrimp will be 21-25, 26-30, and 31-35. For 21-25 count, tolerance will be 15 percent of next smaller size; for 26-30 and 31-35 count, tolerance will be 20 percent of next smaller size.
2. The breading percentage shall be not more than 40 percent coating (batter and breading).
3. Coating content of the chilled shrimp shall be determined as follows:

Prior to freezing, sample units will be drawn in accordance with inspection levels, Table VII, Appendix to MIL-STD-105. Lot size shall be expressed in terms of cartons. Depending on conditions existing in the vendor's establishment, sample units shall be selected on a moving or stationary lot basis. MIL-STD-105 shall apply for selection of samples only.

For packaged units of one pound or less, select at random 1 breaded shrimp from each of selected packages, using inspection level L-6; for packaged units over 1 but not more than 3 pounds, select 2 breaded shrimp from each of the selected sample packages, using L-5; for packaged units over 3 but not more than 5 pounds, select 4 breaded shrimp from each of selected packages, using L-5. Weigh the breaded shrimp. Place the shrimp in a container with slowly running water. Remove coarse material by lightly rubbing breaded shrimp with fingers being careful not to rub off shrimp meat. Place the wet shrimp meat and suspension on a No. 20 mesh sieve or equivalent. Wash off adhering coating material by another wash under a tap or spray with particular attention being given to the tail fin. Place wet shrimp meat on a No. 8 mesh screen and allow to drain for 2 minutes, then weigh. Any shreds of shrimp meat or shell removed during the washing process should be weighed with the larger pieces of shrimp.

Calculate the percentage of breading by the following formula: $\frac{A - B}{A} \times 100 =$ percent of breading. Code: A = total weight of raw breaded shrimp; B = weight of shrimp material after debreading operation; A - B = weight of coating material.

Procurement of breaded shrimp for the Armed Services will be affected under the above changes pending final revision and adoption of Federal Specification PP-S-315, May 3, 1957 for "Shrimp, Frozen, Raw, Breaded."



Fish and Wildlife Advisory Group Meets

The Assistant Secretary of the Interior for Fish and Wildlife announced on June 11 that acceptances have been received from 24 persons invited to become members of a new Advisory Committee on Fish and Wildlife. The first meeting of the group was held in Washington, D. C., June 12-13.

The Secretary of the Interior approved the establishment of the committee to give the Department the benefit of additional advice on the implementation of the Fish and Wildlife Act of 1956 which became law in August 1956. Among other things, this Act authorized the establishment of "a sound and comprehensive national policy with respect to fish and wildlife" and the reorganization of the Fish and Wildlife Service, which is now in process.

Officials of national associations in the wildlife conservation, sport fishing, and commercial fishing fields were invited to serve on the committee. They will serve as individuals and advisers rather than as representatives of their organizations.

This committee will serve a dual purpose, according to the Assistant Secretary. It will enable interested persons to advise the Department on matters concerning fish and wildlife, and also afford the means of informing these persons of problems which confront the Department.

Appointees to the committee will serve for three-year terms ending June 30, 1960. Meetings will be held at least twice a year. At the first meeting the Committee was organized and a chairman and other necessary officers elected by the members.

Among the topics discussed at the first meeting were the possibility of protecting the polar bear from shooting in Alaskan waters beyond the three-mile limit, the status of oil and gas leasing on Fish and Wildlife Service refuge lands, the international fisheries situation, and the task force report on the Service's proposed expanded conservation program.

Members of the new advisory committee are:

Dr. Ira N. Gabrielson, president, Wildlife Management Institute, Washington, D. C.; C. R. Gutermuth, secretary, Natural Resources Council, Washington, D. C.; Michael Hudoba, conservation director, Outdoor Writers Association of America, Washington, D. C.; Carl D. Shoemaker, conservation consultant, Washington, D. C.; Mrs. Marion T. Weaterford, chairman, Conservation of Natural Resources Department, General Federation of Women's Clubs, Arlington, Ore.; John H. Baker, president, National Audubon Society, New York, N. Y.

Howard Zahniser, executive secretary, The Wilderness Society, Washington, D. C.; Emanuel Fritz, University of California, Berkeley, Calif.; Sigurd F. Olson, president, National Parks Association, Ely, Minn.; J. W. Penfold, Izaak Walton League of America, Denver, Colo.; Ernest Swift, National Wildlife Federation, Washington, D. C.; Albert M. Day, Arctic Institute of North America, Washington, D. C.

Richard Stroud, executive vice president, Sport Fishing Institute, Washington, D. C.; Charles E. Jackson, general manager, National Fisheries Institute, Washington, D. C.; Thomas Kimball, chairman, executive committee, International Association for Game, Fish and Conservation Commissioners, Denver Colo.; Richard Borden, Massachusetts Conservation Council, Boston, Mass.; William Apple, Outboard Motor Boat Club of America, Little Rock, Ark.; Don McKee, manager, Tampa Shrimp Producers Association, Inc., Tampa, Fla.

Richard Reed, executive secretary, Maine Sardine Council, Augusta, Me.; Thomas D. Rice, executive secretary, Massachusetts Fisheries Association, Inc., Boston, Mass.; John Linehan, general manager, Seafood Producers Association, Inc., New Bedford, Mass.; George Steele, executive director, Fishery Products Division, National Cannery Association, Washington, D. C.; W. C. Arnold, Manager, Alaska Salmon Industries, Seattle Wash.; and W. M. Chapman, director of research, American Tunaboat Association, San Diego, Calif.



Fisheries Loan Fund

A total of 128 commercial fishery loans for \$3,457,813 had been approved by the U. S. Department of the Interior as of June 24, 1957, under the loan program inaugurated in October 1956. As of June 24, 1957, a total of 256 applications for loans totaling \$10,543,000 had been received. Of that number 37 applications for \$687,566 had been rejected and the remainder still are being considered.

The program was authorized by the Congress in 1956 with the establishment of a \$10 million revolving fund to provide loans to commercial fishermen for financing and refinancing operations, maintenance, replacement, repairs, and equipment of fishing gear and vessels. The loan unit started operating in the Bureau of Commercial Fisheries of the Department of the Interior's Fish and Wildlife Service on October 22, 1956.

Although applications totaling more than \$10 million have been received, the Fish and Wildlife Service has announced that it will continue to accept and list applications for an indefinite period. All applications are processed in the order in which they are received.

Of the loans approved, the New England area leads the list with 50 loans for \$1,568,402. The Pacific Coast is second with 38 loans for \$1,143,525, and the Gulf Coast is third with seven loans for \$414,925. Other loans by areas are: South Atlantic States, eight loans for \$164,600; Alaska, 16 for \$89,425; Great Lakes, six for \$43,220; and Hawaii three for \$33,716.

Since March 18, the last date on which public listing was made of loan recipients, 67 loans for \$1,566,879 have been approved. These loans are distributed as follows: New England, 25 loans for \$688,119; Pacific Coast, 22 for \$553,394; Gulf Coast, five for \$144,675; South Atlantic, five for \$111,800; Alaska, five for \$21,175; Great Lakes, two for \$14,000, and Hawaii, three for \$33,716.

A list of those who have received loans, and the amounts received, between March 18 and June 24 follows:

MAINE--Portland: Trawler Minnie, Inc., \$90,000; Russell, Inc., \$65,000; Raymond Stoddard, \$6,450.

MASSACHUSETTS--Boston: Pattyjean Corporation, \$96,125; Rosa B. Corporation, \$54,215; Vincent & Rose Guarino, \$12,100. Gloucester: Peter E. Doucette, \$31,000; Parker B. Knowles, \$2,817; Edward Gleason, \$8,600; Benedetto Randazza, \$23,735; Schooner Joseph Mattos, \$40,290; Eugene Naves, \$18,500; Charles Melanson, \$3,000; Richard Swan, \$6,050; Rose Bertolino, \$16,357; Frank Foote, \$13,000; John W. Martell, \$4,998; Sylvester F. Whalen, Inc., \$75,000. Fall River: Alfred J. Nassr, \$10,000. Fairhaven: Talgo, Anderson, & Hanney, \$32,317. Salem: George B. Lilly, \$5,676. Medford: Joseph Giacalone, \$27,800. Provincetown: Joseph Corea, Jr., \$18,989. Plymouth: John M. Pinto, \$23,500.

RHODE ISLAND--Narragansett: Stanley Stinson, \$2,600.

VIRGINIA--Mt. Holly: Harry Spencer Bullis, Jr., \$5,000. Phoebus: Trawler South Seas, Inc., \$21,300. Warwick: J. Frank Topping, \$25,000.

SOUTH CAROLINA--Mt. Pleasant: Barry J. Wilson, \$5,500.

GEORGIA--Savannah: Jackson Seafood Co., \$55,000.

MISSISSIPPI--Pascagoula: Cisroe & Eva Ewing, \$17,000; Louis Lee Bond, \$32,275.

LOUISIANA--New Orleans: Alphen Seafoods Corp., \$50,000. Galiano: James Tillman, \$35,000. Lake Charles: J. W. Murphy, \$10,400.

MICHIGAN--Port Huron: George A. Lixey, \$10,000.

MINNESOTA--Knife River: Lawrence W. Bugg, \$4,000.

CALIFORNIA--San Diego: Robert Ursich, \$68,900; Maurice Bernardini, \$100,000; White Sea Corporation, \$84,100; George W. Murphy, \$12,077. San Pedro: A. & J. Pilato, \$25,000; T. Austrem & O. Edwards, \$35,900; W. H. Hoopes, \$9,000; Xitco & Anderson, \$31,887. Lakeside: W. H. Babcock, \$30,000. Castroville: Francis C. Furber, \$10,000. Morro Bay: Sigurd O. Sommersell, \$5,900. Benicia: Ted Bean, \$5,630.

OREGON--John Day: Jim Lyons, \$12,500.

WASHINGTON--Seattle: Olaf & Sig Hendricks, \$12,000; Erling E. Jacobsen, \$20,000; Thor Botten, \$12,700; Ole Lillenes, \$3,000; John Lindsley Grover, \$3,000; Edwin Knudsen, \$7,300. Tacoma: Arthur Carlson, \$1,500; Western Ace Corp., \$60,000; Chester Kimmerly, \$3,000.

ALASKA--Juneau: George J. Katzeek, \$4,900; John Pentilla, \$4,975; Chris & Anita McNeil, \$5,000. Ketchikan: Russell Heath, \$2,500. Elfin Cove: Leroy Clements, \$3,800.

HAWAII--Honolulu: Louis Agard, Jr., \$15,000; Oliver Kinney, \$14,000; Manjiro Taki, \$4,716.



Freezing Fish at Sea

SERVICE INAUGURATES ENGINEERING STUDY OF TRAWLER-FREEZER-SHIP: A contract has been awarded by the U. S. Fish and Wildlife Service for an engineering study of a new North Atlantic trawler equipped to freeze fish at sea, the Department of the Interior announced July 8.

The \$15,000 contract, which may lead to significant improvement in New England's commercial fishing operations, has been awarded to Dwight Simpson and Associates, naval architects located in Boston, Mass.

The request for this study was made by the New England Committee for Aid to the Groundfish Industry. The study will include development of a preliminary design and will incorporate the principles and techniques for handling and freezing fish at sea developed over the past six years by the Fish and Wildlife Service. Funds for the study are provided by the Saltonstall-Kennedy Act for improving domestic fisheries.

The preliminary findings and design will be used by interested segments of the New England fishing industry for calculating the earning capacity of the proposed vessel under conditions met in the New England fishery.

If these determinations are favorable and if the decision is made to construct such a vessel, the actual construction is expected to be undertaken by the industry.

Since the fish can be frozen immediately after being taken aboard, the craft will permit fishermen to range farther from port and to remain at sea until a full load of fish is obtained. It will assure the landing of fish in much better condition and provide the consumer with a more uniformly high-quality product. It will also permit the processor to stockpile the fish and to establish regular production schedules for handling them.

Under present conditions, vessels depend upon ice to preserve the cargo and must return to port after ten days of fishing, often only partially loaded. Processors are faced with alternate periods of glut and scarcity with little or no chance of stockpiling the catch.

Basic specifications laid down by the Fish and Wildlife Service are that the plans must provide for a steel-hull, diesel-powered trawler capable of operating in any fishing weather and at distances much beyond present limits. It must be more than 140-feet long with sufficient space for the refrigeration equipment necessary for freezing at sea, sufficient "payload" space to permit profitable operation, and have the mechanical equipment necessary to handle fish with utmost care.

The Service's exploratory fishing vessel Delaware in recent months has returned with two 100,000-pound loads of fish fresh-frozen at sea and delivered the loads in a "sea fresh" condition. These were large-scale tests of techniques and equipment. Portions of these fish were used for further experimental studies ashore and the balance sold at auction.



Gulf Exploratory Fishery Program

TRAWLING GEAR TO BE TRIED IN RED SNAPPER FISHERY: The chartered vessel Silver Bay, which is a conventional North Atlantic-type dragger under a two-year charter to the U. S. Fish and Wildlife Service, was scheduled to start a red snapper trawling cruise off the coasts of Texas and Louisiana about the middle of June 1957. The objective of the cruise was to find out whether or not bottom trawling gear can be used in the red snapper fishery of the Gulf of Mexico.

The Silver Bay exploratory fishing operations will be supplemented by the use of the Service-owned M/V Oregon. The chartered Silver Bay is steel-hulled, 96.5 feet in length, has a beam of 22.5 feet, a draft of 12 feet, a 562-horsepower main engine, and a cruising range of 4,500 miles.

The cruise, as planned, will include experimental fishing on the broken bottom areas off Texas and Louisiana in depths of 20-100 fathoms, using both conventional and modified New England-type otter trawls.



Interior Department Approves Proposal to Study Effect of Pesticides on Fish and Wildlife

A comprehensive study of the effect which the use of billions of pounds of pesticides is having upon fish and wildlife is needed for the protection of these valuable natural resources, the Assistant Secretary of the Interior for Fish and Wildlife Leffler advised the Congress in May.

In commenting upon H. R. 783 which specifically directs the U. S. Department of the Interior to make such a study. The Assistant Secretary stated that while he was certain the general powers of the Department provides authority to pursue such investigations, passage of the bill would "express the interest of the Congress in this particular program which we consider to be vital to the conservation of the Nation's fish and wildlife resources."

It was pointed out that last year 65 million acres of cropland--one sixth of the Nation's farm land devoted to crops--and more than three million acres of forests were treated with three billion pounds of pesticides.

"The importance of our forests and agricultural crops is unquestioned," the Assistant Secretary said. "Both are vitally needed. Likewise, insect and other

pest control is necessary. However, pesticide programs have gone ahead without adequate information on the effects which the pesticides have on fish and wildlife resources. A multi-billion dollar recreation and commercial fishery industry of interest to more than 30 million Americans is involved.

He stated that some insecticides in concentrations "ten times the concentration which can be tolerated by wildlife" are being used with the resultant death of thousands of birds. He also gave examples of huge fish losses following extensive sprayings of forest trees.

He pointed out that it should be possible for sponsors of spraying projects to have advice on the possible effects of the spraying on wildlife, suggestions as to timing, and the formulations needed to accomplish the desired effect with a minimum damage to fish and wildlife.

Also stressed was the need for pesticide studies because of the Department's obligations under the migratory bird treaties.

He urged that combined laboratory and field investigations be conducted in cooperation with other agencies such as the Forest Service of the Department of Agriculture. Some of the objectives would be: tests of the toxicity of new insecticides for birds, mammals, and fish; development of diagnostic tests to permit determinations of whether or not animals were killed by specific pesticides; studies of the application of insecticides in forest pest control; studies of the effects on fish and wildlife of the control of grasshoppers, Mormon crickets, Japanese beetle, corn borers, and other farm pests; marsh studies on mosquito production and control in relation to waterfowl habitat preservation.



Irradiated Food--Commercial Production Envisioned by 1960

Initial production by commercial industry of foods preserved by radiation may start in 1960, according to a report released June 17 by the Interdepartmental Committee on Radiation Preservation of Foods.

By 1960, the report states, it is expected that the wholesomeness and economic feasibility of radiation-preserved foods will have been determined and large-scale tests conducted by the Army will have ascertained how well these foods are accepted by consumers.

The Interdepartmental Committee was established in May 1956 to conduct work on the irradiation preservation of food program and includes representatives of the Department of the Army and the Department of State, Interior, Agriculture, Commerce, Health, Education and Welfare, and the Atomic Energy Commission. It is headed by Dr. William H. Martin, Director of Research and Development, Office of the Secretary of the Army.

Various government agencies are expected to expand their participation in the program as it progresses, as funds become available, and as pertinent phases are developed, according to the report. This is designed to insure a rapid but well-planned transition of this method of food preservation into the industrial community.

Concurrently, the Army Quartermaster Corps, assigned primary responsibility for directing the Department of Defense food radiation program, will continue its activities. This includes construction of the Army Ionizing Radiation Center at

Sharpe General Depot, Lathrop, Calif. The Center, first of its kind ever to be constructed for food radiation, is expected to be completed and in operation within two years. It will include a reactor to be supplied by the Atomic Energy Commission and a high energy particle accelerator to be constructed by the Army Quartermaster Corps.

Primary mission of the Center at Lathrop will be to develop methods of utilizing ionizing radiation to preserve food and to develop the economics of the process.

Physical examinations and other tests of human volunteers and animals fed irradiated foods in an initial feeding test indicate that this new method of food preservation does not significantly alter the wholesomeness of food, the report sets forth. A two-year feeding program, using both human volunteers and animals, has been started to determine the wholesomeness of the food according to government regulatory statutes.

Outlining what has been done to date in the field of food irradiation, the report states that during fiscal year 1956 the Army Quartermaster Corps completed a preliminary study of 80 selected foods, obtaining general information to be applied in future operations of the pilot plant. During fiscal year 1957, research has been concentrated on developing more specific information on certain foods. Other agencies are completing initial investigations in areas of product and process development. A program for industry participation on the research and development level has been started and will be expanded as phases of the process unfold. There are presently more than 70 industrial firms and educational institutions participating in the research program.

During fiscal year 1958, further taste-testing studies, as well as packaging and storage studies, will continue. It is expected that by fiscal year 1959, with the process in more advanced form, industry participation will sharply increase. At this point, pilot-plant research on 20 foods and subsequent production of selected merchandizable foods will have started. Much of this food will be used in fulfilling the legal requirements of the Food and Drug Administration in animal and human testing. Information on equipment design and production cost data will become available as a result of these studies, as well as information on government economic aid which can be extended to industry.

By fiscal year 1960, according to the report, the Army proposes to conduct large-scale troop acceptance tests. About this time a trial procurement of a few selected items from industry will be made by the Army.

Explaining the radiation preservation of foods, the report states:

"In this totally new process of preserving foods, the properties of gamma rays from fissionable materials, or of electrons from machines, are utilized to extend the storage life of foods by inhibition of sprouting and the destruction of microorganisms, parasites, or insects. The control of the transmission of such diseases as trichinosis from pork or salmonellosis from dried eggs is a related area of application.

"The food preserved by this method is subjected to a minimum temperature rise and a short exposure time and, in cases where the process is applied successfully, tends to retain its original characteristics. The process shows promise of extending the shelf life of foods through 'pasteurization' treatment, and while the sterilizing dose has not yet been established, certain food products have been apparently successfully sterilized. The product thus treated may be held without refrigeration after sterilization although the still active enzymes in time will affect the quality of the food. In other cases this enzymatic effect can be utilized to im-

prove the quality of the food; for example, meat may be tenderized through the properly controlled action of naturally-occurring enzymes."

Members of the Interdepartmental Committee on Radiation Preservation of Foods, in addition to Dr. Martin, are: Department of State, Gerard C. Smith, Special Assistant to the Secretary for Atomic Energy Matters; Department of the Interior, Arnie J. Suomela, Commissioner of Fish and Wildlife; Department of Agriculture, Ervin L. Peterson, Assistant Secretary of Agriculture; Department of Commerce, H. B. McCoy, Administrator, Business and Defense Services Administration; Department of Health, Education and Welfare, Dr. Aims C. McGuinness, Special Assistant to the Secretary for Health and Medical Affairs; Atomic Energy Commission, A. Tammara, Assistant General Manager for Research and Industrial Development. Dr. Kevin G. Shea, Office of the Quartermaster General, Department of the Army, is executive secretary for the committee.



Japanese Fishery Officials

Confer with U. S. Fish and Wildlife Service

United States and Japanese officials concerned with the commercial fishing industry met informally June 27, 1957, at the U. S. Department of the Interior.

The occasion was the courtesy call which Takechiyo Matsuda, member of the Japanese House of Representatives and chairman of the International Tuna Council, made upon Ross L. Leffler, Assistant Secretary of the Interior for Fish and Wildlife. Matsuda was accompanied by Takeshi Kimura, Agricultural Counselor at the Japanese Embassy in Washington. In Japan, the fisheries program is part of the Department of Agriculture and Forestry.

Various phases of the commercial fishing activities, including many problems common to Japan and the United States, were discussed during the meeting.

Matsuda, who is in this country with Prime Minister Kishi's party, will be a member of the Japanese group meeting with American tuna industry men in California in mid-August to discuss a joint tuna-advertising program.



Maine

CANNED SARDINES PROMOTED BY BOY SCOUTS AT JAMBOREE: A total of 250 Maine Boy Scouts acted as unofficial ambassadors for their State's sardine industry at the National Jamboree at Valley Forge, Pa., held in July.

When they joined the 50,000 other youngsters from all over the nation at the Tent City, they were wearing long-visored, properly inscribed fishermen's caps to denote that they are "Down-East Herring Choker" members of the "Maine Sardine Sandwich Society."

The little fish also featured the gateway to the Maine section of the campground which was erected by the Scouts. Connecting the entrance made of large fish weir piles was a sign bearing the inscription "Maine--First in Sunshine and Sardines."

In addition, the Pine Tree Scouts used several thousand sardine-can coin banks as their traditional items for swapping with their fellow Jamboree campers.

All this was brought about through the cooperation of the Maine Sardine Council. That organization arranged to have sardines served on the master menu of the Jam-boree at least twice during the event and supplied 40,000 cans for the purpose.

As the theme of the New England delegation was tied in with the arrival of the Mayflower at Plymouth, the Maine Scouts chose the sardine industry, which was the first major food-canning operation in this country, as their historical subject.

* * * * *

SARDINE COUNCIL LAUNCHES SUMMER ADVERTISING CAMPAIGN: The Maine Sardine Council launched a 9-week summer radio spot advertising campaign on July 1, 1957 to help move the industry's 1957 pack.

The Council's Chairman stated that the Council would again concentrate its activities in the ten southern states of Virginia, North and South Carolina, Georgia, Alabama, Florida, Tennessee, Louisiana, Mississippi, and Texas.

This formula was adopted last year because of the importance of the market and to enable the Council to better measure and test the impact and results of its advertising and merchandising efforts. Plans to expand the coverage to other areas in future campaigns were being studied.

A total of 97 radio stations in 69 key markets were scheduled to be used with the frequency of spots running from 25 to 35 a week in the various cities.

The message was to be carried through tuneful jingles, supplemented by live announcements telling the story of sardines from Maine, "the convenience seafood in the familiar flat cans that you and your family have been buying for years." In addition, the product's nutritive values and the versatility of the item also were featured.

The campaign was to be backed up with sales promotion and merchandising activity.



Maine Sardines

CANNED STOCKS, JUNE 1, 1957: Distributors' stocks of Maine canned sardines totaled 230,000 cases as of June 1, 1957--70,000 cases or 44 percent more than the stocks on hand June 1, 1956. Stocks held by distributors on April 1, 1957, amounted to 295,000 actual cases, according to estimates made by the U. S. Bureau of the Census--35,000 cases less than stocks held on June 1, 1957.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Cannery's Stocks, June 1, 1957											
		1956/57 Season				1955/56 Season					
		6/1/57	4/1/57	1/1/57	11/1/57	7/1/56	6/1/56	4/1/56	1/1/56	11/1/55	
Distributor	1,000 actual cases	230	295	344	388	154	160	268	326	354	
Canner	1,000 standard cases ^{1/}	416	465	879	1,016	315	64	152	475	625	

^{1/} 100 3½-oz. cans equal one standard case.

Cannery's stocks on June 1, 1957, totaled 416,000 cases (100 3½-oz. cans) as compared with 64,000 cases on June 1, 1956, and 465,000 cases on April 1, 1957.

The new Maine sardine packing season opened on April 15, but there was no significant amount packed until late in May. The season ends December 1, 1957.

The pack April 15 to June 1, 1957, was 126,000 cases. On April 15, 1957, the carryover by the canners was about 426,000 cases.



Market Outlook for Fishery Products

JULY-SEPTEMBER 1957: As the fishing fleets bring in heavy seasonal catches of many varieties of fish and shellfish, the distribution segment of the industry is planning three promotional campaigns to assure the fullest possible use of the various products, according to Commercial Fisheries Outlook, July-September 1957 published by the United States Fish and Wildlife Service.

The three promotional campaigns are National Fish Week, September 18-28; National Canned Salmon Week, August 23-30; and National Tuna Week, October 24-November 1. The Service's Bureau of Commercial Fisheries will cooperate in all these promotional campaigns.

Seasonal highs will be reached in the landings of halibut, ocean perch, whiting, salmon, lobsters, shrimp and haddock during the quarter. Surf clam, hard crab, and Maine sardine landings also will be at their peak. The Atlantic Coast oyster fishery is recovering some from the hurricane damage of recent years and will begin cutting down on the backlog of orders in September when the new season opens.

Indications from the Pacific halibut fishery are that the catch this year will equal the 67-million-pound harvest of 1956. Shrimp production will depend upon weather conditions in the Gulf of Mexico, but unless hurricanes interfere the harvest should be about the same as last year.

Maine lobster landings for the first four months have been 27 percent higher than during a like period in 1956, but somewhat lower than during the first four months of 1955.

Canned Maine sardine inventories should improve as the fishery enters the peak production period.

Prospects are for a light pack of California sardines, but the pack of Pacific mackerel is 70 percent above that of the same period in 1956.

Fresh-water fish landings will be light during the summer.

Surf clam landings in New Jersey are 68 percent above those of 1956 and 130 percent above those for 1955.

Soft clam landings will be low, but soft crabs will be in good supply.



New York

ADVISORY COMMITTEE APPOINTED TO STUDY MARINE SPORT AND COMMERCIAL FISHING: Appointment of the New York Conservation Commissioner's Advisory Committee to study both sport and commercial fishing in the Marine District (Long Island) was announced on April 18, 1957, by the Commissioner.

"This committee will be the first of its kind, so far as Department records show," he stated. "Its need was clearly shown by the recent Crossley survey which revealed that more than 600,000 New York sportsmen fish in our Marine District."

Members of the committee were furnished copies of a recent study made by the management unit of the New York State Budget Division, which made suggestions for improvement of marine district operations and services. The first meeting of the committee was held in April.

The membership of the Committee, all residents of New York, is as follows: Ed Moore, New York Journal-American Chairman; Jim Hurley, New York Daily Mirror; Dick Cornish, New York Daily News; Jack Randolph, New York Times; Dan Lionel, New York Herald Tribune; Frank Keating, Long Island Press, Jamaica; William Paulson, Newsweek Magazine; Russell Crandall, Fishing Long Island Waters, Roosevelt; Harold Kimball, Past President, Southern New York Fish and Game Association, Yonkers; John Suydam, President, National Party Boat Owner's Alliance, Lydenhurst; Herbert Lieblen, Fishing Station Operator, Long Island Rowboat Association, Southold; Nicholas Griek, Secretary, Long Island Fishermen's Association, West Sayville; John Binner, President, Sportsmen's Council of the Marine District, Long Island City; and John Sweek, Member, Sportsmen's Council of the Marine District, Long Island City.



North Atlantic Fisheries Exploration and Gear Research

EXPERIMENTAL LONG-LINE TUNA TRIP SUCCESSFUL (M/V Delaware Cruise 57-5): The second experimental long-line fishing cruise (June 6-July 5) of the Service's exploratory fishing vessel Delaware in the offshore waters of the Western Atlantic resulted in a catch of 18 short tons of tuna. During the cruise the Delaware occupied 17 stations over a 68,000-mile area south and southwest of Georges Bank. The long-line fishing stations were planned to give a broad over-all picture of the distribution of tuna in the Northwest Atlantic and supplemented the long-line cruise made March 15-April 12.

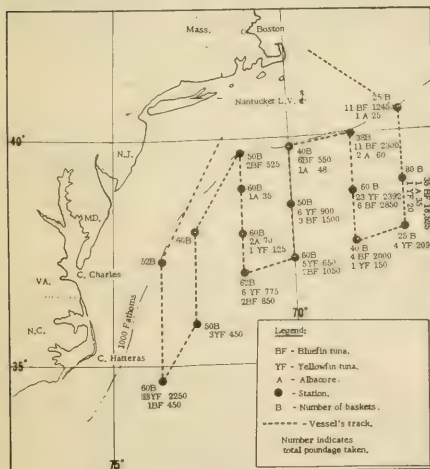


FIG. 1 - M/V DELAWARE CRUISE 57-5, JUNE 6-JULY 5, 1957.



FIG. 2 - LANDING A LONG-LINE-CAUGHT BLUEFIN TUNA FROM THE GULF STREAM OFF GEORGES BANK.

An excellent catch of 16,500 pounds of bluefin tuna (*Thunnus thynnus*) was made in an 80-basket set 140 miles south of Georges Bank. Two other stations, one 135 miles south of Nantucket, and another 85 miles ESE. of Cape Hatteras, yielded ov-

er one ton of yellowfin tuna (Thunnus albacares). No gear loss was reported during the cruise, although the large bluefin caused gear snarls on several occasions. Shark damage to tuna was much less than expected.

The 159 tuna caught by the Delaware weighed 38,039 pounds. The catch consisted of 83 bluefin (29,845 pounds), 8 albacore (273 pounds), and 68 yellowfin (7,921 pounds).

The general distribution of tuna in the offshore area during June was found to consist primarily of small bluefin and scattered albacore (Thunnus alalunga) at the more northern stations and yellowfin at the southern stations located in the warmer waters of the Gulf Stream.



FIG. 3 - SOME OF THE TUNA CAUGHT BY THE DELAWARE, SUCH AS THIS BLUEFIN, IF IN GOOD CONDITION, ARE TAGGED AND RELEASED.



FIG. 4 - A CATCH OF LARGE BLUEFIN TUNA ON THE DECK OF THE DELAWARE.

A comparison with the March 15-April 12 cruise indicates large bluefin and yellowfin are more available in the north latitudes at this season of the year. Bluefin of the 300- to 350-pound size comprised the excellent catch made by the Delaware in the Gulf Stream during March 1957, but these fish were not found in any quantity during the recent cruise. Lancetfish (Alepisaurus ferox) were found to be present in fewer numbers than in March.

Other species of fish and sharks taken during the cruise consisted of 45 common dolphins (Coryphaena hippurus), 6 white marlin (Makaira albida), 5 wahoo (Acanthocybium petus), 3 lancetfish (Alepisaurus ferox), 32 white-tipped sharks (Pterolamiops longimanus), 14 blue sharks (Prionace glauca), and 3 dusky sharks (Carcharhinus obscurus).

In cooperation with the Woods Hole Oceanographic Institution, surface temperatures and bathythermograph casts were taken at all fishing stations. Night-lighting was conducted at most stations, and morphometric measurements and life history information on the tuna was compiled. A total of 15 fish consisting of 1 albacore, 5 bluefin, 10 dolphins, and 1 white marlin were tagged with the Institution's dart tags during June 21-July 5.

Unfavorable weather hampered operations during the first and last days of the cruise. The Delaware returned to East Boston on June 15 to repair the long-line

puller, obtain additional frozen herring (Clupea harengus) for bait, and repair the ship's refrigeration system.

The Delaware was scheduled to leave on July 16 to conduct otter-trawling operations on Georges Bank or in the South Channel area for haddock. The freezing-fish-at-sea equipment will be used to freeze fish for handling-and-storage tests by the fishing industry.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, MAY 1957 P. 78.



North Atlantic Fishery Investigations

EFFICIENCY OF SCALLOP DREDGES WITH DIFFERENT SIZE RINGS STUDIED (M/V Whaling City, June 13-23): Thirty drags were made in the Cultivator Shoal and Northeast Peak of Georges Bank areas with two scallop dredges fished simultaneously to test the relative efficiency of 2-, 3-, 3½-, and 4-inch metal rings in the bag of the scallop dredge. The bags of the scallop dredges fitted with the different size rings were tested as follows: the 2-inch ring was tested against the 3-, 3½-, and 4-inch rings; the 3-inch ring was tested against the 3½- and 4-inch rings. During this cruise by the Service-chartered vessel Whaling City, 67,000 scallops were measured and due to the large volume of data collected, no conclusions can be drawn at this time.

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FISH BEHAVIOR IN COD ENDS STUDIED WITH UNDERWATER TELEVISION (M/V Albatross III Cruise 96): The behavior of fish within a standard otter trawl was studied with an underwater television camera and the observations were documented with moving and still pictures during a June 19-26 cruise of the M/V Albatross III. The cruise of this Service research vessel was planned to make studies of the effect of covers and chafing gear on the behavior of the fish within the net. Operations were carried out in Cape Cod Bay and in South Channel of the Southern Massachusetts coast.

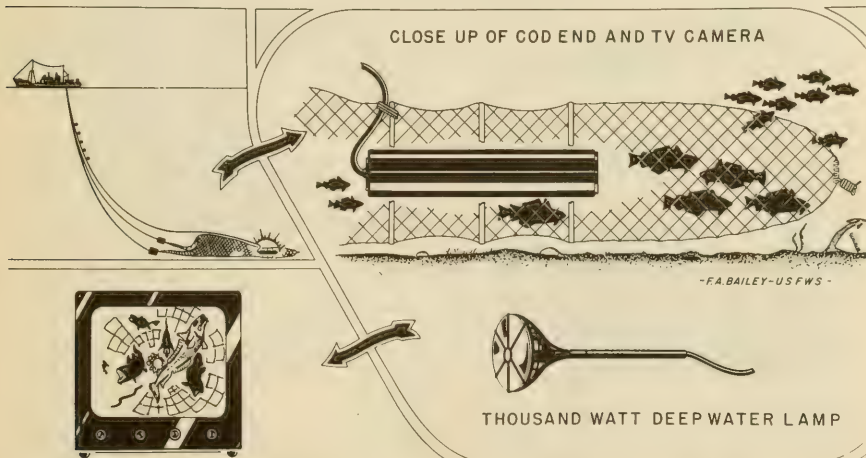


FIG. 1 - DIAGRAMATIC SKETCH SHOWING THE OPERATION OF THE UNDERWATER TELEVISION CAMERA BY THE ALBATROSS III.

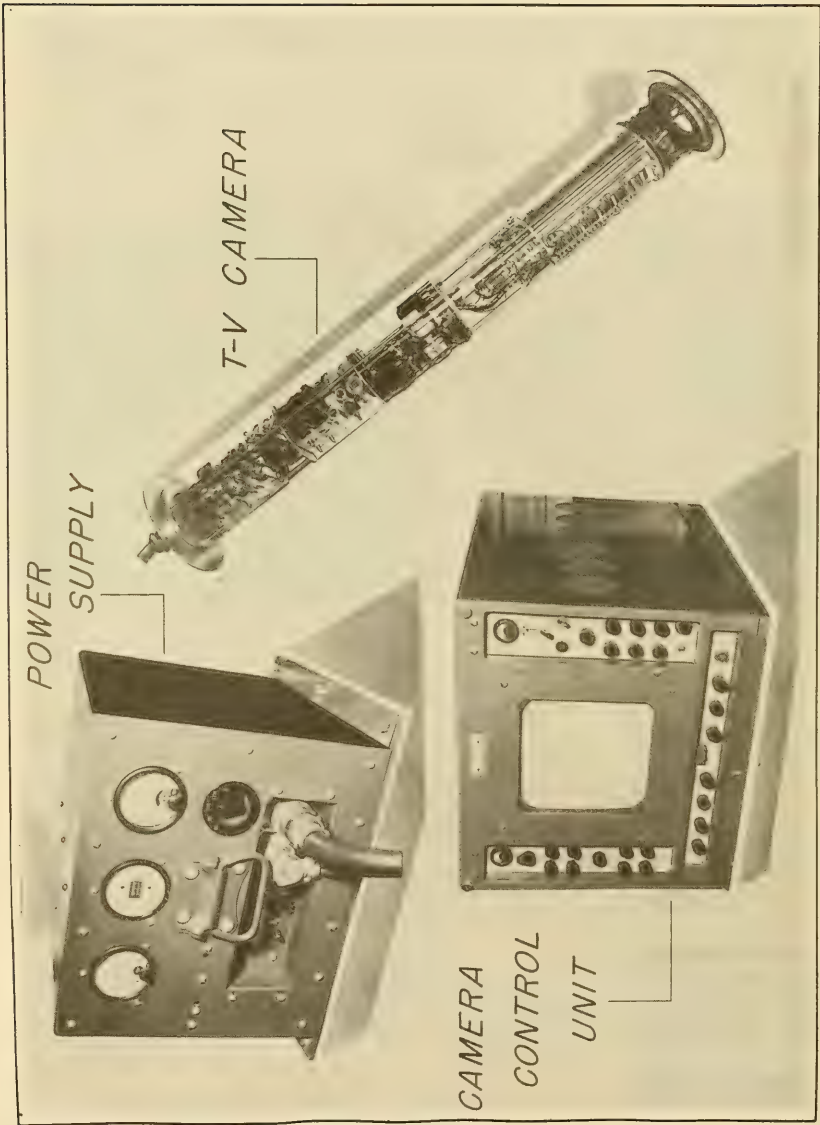


FIG. 2 - PRINCIPAL COMPONENTS OF UNDERWATER TELEVISION CAMERA USED BY THE SERVICE'S RESEARCH VESSEL ALBATROSS III.

The television camera was rigged within a standard otter trawl in the following ways: (1) suspended inside a cod end provided with a standard small mesh cover used in mesh-selection experiments; (2) suspended as in (1) and provided with chafing gear in the top according to International Commission for Northwest Atlantic Fisheries standards; (3) positioned just above the cod end covered with chafing gear; (4) suspended from the top belly of the net (SCUBA divers were employed to check positioning of camera in this operation).

High turbidity in Cape Cod Bay prevented good viewing. Turbidity varied from moderate to nearly absent in South Channel. Good catches of haddock and moderate catches of whiting, cod, and other species in South Channel provided good results in (1) and (2).

Because of damage to fishing gear, time was sufficient to conduct only a preliminary study under (3). SCUBA divers found gear to require only minor adjustments in positioning. High turbidity in Cape Cod Bay prevented satisfactory viewing of gear and fish in (4). These studies will be continued on Cruise 97 with particular reference to whiting.

* * * * *

VESSEL LICENSES FOR USE OF SMALL-MESH COD END DISCONTINUED: Suspension of the "study boat" program involving the Boston offshore haddock trawler fleet was announced by the United States Fish and Wildlife Service Biological Laboratory at Woods Hole, Mass. Licences expired June 30, 1957, and were not renewed, and no additional licenses will be granted.

In this program a group of 5 to 8 haddock trawlers were licensed to fish with a small pre-regulation size net mesh since June 1953, to provide data for determining the effect of the regulation. At a meeting of the scientific advisors for the International Commission for the Northwest Atlantic Fisheries it was agreed that sufficient information has been obtained with the small mesh ($2\frac{7}{8}$ " internal size) to provide adequate comparison with the large mesh ($4\frac{1}{2}$ " internal size).

The purpose of the small-mesh net study group was to provide an index of abundance of haddock comparable to that obtained in the 1931-1952 haddock studies. With this index biologists are able to determine the relative success of each year-brood of haddock as it enters the fishery. Preliminary studies by Service biologists at Woods Hole have shown that broods of equal initial size are now yielding much greater landings than before the regulation went into effect.

A more intensive analysis of the effect of the regulation will be carried out this year with data already at hand. If these more detailed studies confirm the present findings there will be no further need for small-mesh net study boats in the future.



Oregon

SPRING KING SALMON RUN IN COLUMBIA RIVER GOOD: The 250,000 spring king salmon that were caught by commercial fishermen or escaped into the upper river spawning grounds is the second highest spring run since the completion of Bonneville Dam in 1938.

Additional reports from fish dealers along the Columbia River boosted total Oregon spring king (chinook) salmon landings during May to approximately 1,130,000 pounds, the Oregon Fish Commission reports in a news release. Although the reports were only 95 percent complete, all major fish dealers had reported their May

receipts. The Oregon landings of Columbia River king salmon plus the landings received by Washington dealers during the same period resulted in a combined Oregon-Washington catch of about 1,700,000 pounds, the sixth highest spring catch in 20 years.

Oregon Fish Commission biologists estimated that approximately 113,000 spring king salmon were caught in the Columbia this year. The catch represents about 45 percent of the spring king salmon that entered the river. These estimates exclude the Willamette and Cowlitz River runs that, for the most part, pass through the Columbia River prior to the opening of the spring gill-net season.

Combining the spring catch with the Bonneville counts of spring king salmon gives a fair idea of the size of the upper river spring run. The figure thus obtained for 1957 is close to 250,000 fish--the second highest spring king run to enter the Columbia River since completion of Bonneville Dam in 1938.

Spawning escapements of better than 100,000 spring king salmon above McNary Dam this year is 2.5 times greater than the highest previous McNary count. Most of the major spring king spawning areas of the Columbia River system are located above McNary in tributaries of the Columbia and Snake Rivers.

Columbia River commercial fishing regulations, set jointly by the Fish Commission and the Washington Department of Fisheries, apparently accomplished the intended purpose this year. Commercial gill-netting above Bonneville Dam was prohibited by the state regulatory bodies this year in hopes of increasing upriver spring king escapements.

The large run this year provided an above-average commercial catch as well as the desired escapements. The Commission attributed at least part of the increased spring run this year to improved spawning escapements in 1953.



Oysters

LONG ISLAND SOUND RESEARCH PROGRAM FOR 1957: During the summer of 1956 the Service's Marine Biological Laboratory at Milford, Conn., completed an extensive study of several important aspects of gonad development, spawning, and setting of oysters in Long Island Sound. At present, the data are being analyzed and prepared for publication. As soon as the analysis of different portions of the studies is completed, a report will be issued.

Plans for the summer of 1957 include a new series of observations concerned principally with the occurrence, distribution, behavior, and physiological requirements of oyster larvae. This work will be centered in Milford Bay and only 3 setting stations, instead of the 10 or more of the previous years, will be maintained. Therefore, weekly bulletins with information on the intensity of setting in different sections of Long Island Sound will not be issued. The Milford Laboratory will be glad to continue examination of cultch for oystermen who bring it to the laboratory. Occasional bulletins, based on the studies in Milford Bay, will be issued if results are of general interest.



Pacific Oceanic Fisheries Investigations

ALBACORE TUNA ABUNDANT OFF COASTS OF OREGON AND WASHINGTON:

Large numbers of albacore tuna were reported off the coasts of Oregon and Washington, centered about 700 miles west of Eureka, Calif., by the Service's Pacific Oceanic Fishery Investigations (POFI) research vessel John R. Manning. Between June 19-23, 1957, albacore weighing between 12-20 pounds were taken by gill net and trolling. The best day yielded 97 albacore. Details of the catches are shown in table.

The John R. Manning was conducting a general reconnaissance preliminary to the Northeastern Pacific Albacore Survey, scheduled to begin July 22. During this survey 9 chartered commercial vessels were expected to search for albacore along predetermined tracks from the coast to 350 miles offshore. The tracks are evenly spaced from central Washington to central California. Reinforcing these chartered vessels were to be the research vessels John R. Manning concentrating on albacore, and the Hugh M. Smith concentrating on hydrography.

The objective of the survey is to define precisely the distribution of albacore off the coast in midsummer, and even more important, to learn the conditions in the ocean that govern their distribution. This knowledge will be a long step towards placing the Pacific Coast albacore fish on a rational basis, as opposed to the hit or miss situation prevailing now.

It has been hypothesized that albacore fisheries

fluctuate chiefly because conditions in the ocean that control their distribution change. Thus, a good year might result when the ocean brings albacore close to shore, where they are easily found. A poor year might simply mean that ocean conditions hold the fish 300 or 400 miles offshore--too far off to be discovered by chance.

Once the situation is understood, scientists think there is a good chance of predicting when and where albacore can be found, thus eliminating disappointment and waste through fruitless scouting.

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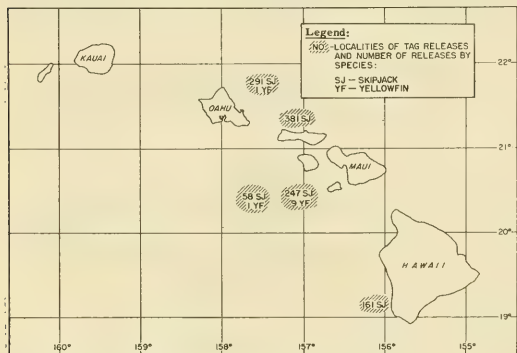
SKIPJACK TAGGED BETWEEN ISLANDS OF OAHU AND HAWAII (M/V Charles H. Gilbert Cruise 33): Live-bait fishing for and tagging of tuna was conducted April 23-May 17, 1957 by the Service's research vessel Charles H. Gilbert on this cruise. A total of 1,138 skipjack and 11 yellowfin tuna were tagged with experimental D-2 tags. The cruise was originally planned to tag and release skipjack tuna in the offshore waters east of Hawaii, but this plan had to be abandoned because of rough seas and the absence of live bait. Instead, tagging operations were focused in the areas between Oahu and the Kono coast of Hawaii. The tagged skipjack weighed 9 pounds or less and the yellowfin between 4 and 5 pounds. The Service's research vessel John R. Manning also tagged tuna as part of this program.

Tilapia was used on 4 schools of fish with inconclusive results. One was a mixed school of skipjack and yellowfin, two were unidentified, and one was dolphin (mahimahi). No fish was caught using tilapia as live bait; however, fish were observed to be feeding momentarily at the surface, probably in response to the tilapia, which tended to sound when chummed.

Date	Longitude	Latitude	Water Temperature	Gill Net ^{1/}	Troll
June 19	144° W.	37° N.	64°	-	24
June 20	142° W.	37° N.	64°	41	9
June 21	139° W.	39° N.	62°	-	9
June 22	137° W.	40° N.	60°	92	5
June 23	135° W.	41° N.	60°	-	15

^{1/} GILL NETS WERE NOT FISHED WHERE NO CATCHES ARE INDICATED.

Three passes, using tilapia as chum, were made on a mixed school of skipjack and yellowfin before switching to nehu (Hawaiian anchovy). Fish appeared immediately at the stern after nehu was chummed. Apparently the fish were feeding on tilapia, then surfaced to feed on nehu, which characteristically remains at the surface. One yellowfin was observed to have gorged itself with tilapia.



CHARLES H. GILBERT CRUISE 33 (APRIL 23-MAY 17, 1957).

During 19 days of scouting, 3 skipjack, 1 yellowfin, 2 dolphin, 5 mixed schools of skipjack and yellowfin, 1 mixed school of skipjack, yellowfin, and dolphin, and 28 unidentified schools were sighted.

Surface trolling with 4 lines during all scouting runs resulted in a catch of 9 dolphin, 4 yellowfin, and 1 skipjack. One 1-hour night surface haul for larval fish was made during the cruise.

Broadcasts of scouting results were made to the local skipjack fleet twice daily with few exceptions.

Schools of large skipjack were very scarce; only two schools of medium to large fish were encountered during the cruise, and these were pursued and chummed at great length without any success. The fish appeared alongside the vessel occasionally but failed to respond to chum at the stern.

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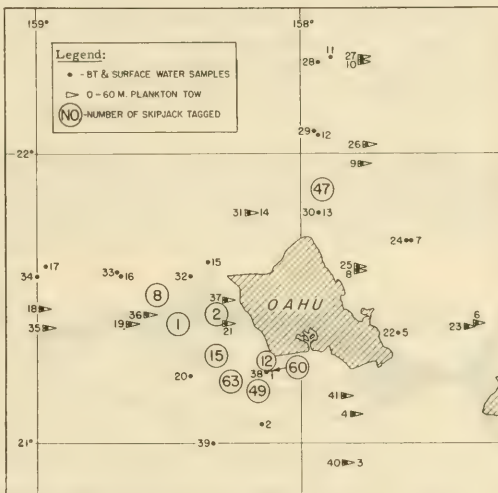
SKIPJACK TUNA TAGGED AROUND HAWAIIAN ISLAND OF OAHU (M/V John R. Manning Cruise 35): An intensive effort to release as many tagged skipjack tuna in Hawaiian waters as possible before the summer fishing season got under way was nearly completed by the Service's research vessel John R. Manning during this cruise (April 16-May 14, 1957). Within a 20-mile radius of Oahu Island, a total of 257 skipjack tuna were tagged and live-bait fishing was also conducted. The Service's research vessel Charles H. Gilbert also tagged tuna as part of this program.

The cruise of the John R. Manning was planned to tag and release skipjack tuna within the area of the skipjack tuna fishery to learn the recovery rate of an experimental "harpoon type" dart tag and to collect environmental data in this area. During this phase of the cruise, 20 monitoring stations (see chart) were occupied twice, at the beginning and the end of the cruise. On each station a bathythermograph cast was made and surface salinity and phosphate samples were obtained. A total of twenty 30-minute plankton tows to a depth of 60 meters was made.

The tagged skipjack tuna included 63 large "season fish" averaging about 18 pounds each and 194 fish in the $1\frac{1}{2}$ - to 7-pound size range. In addition to tagging experiments and the environmental studies, tests were made on the effectiveness of tilapia (*Tilapia massambica*) as live bait.

A total of 50 fish schools were sighted during the cruise, of which 23 were approached and chummed with live bait.

Some fish were taken from 10 schools, and fish were tagged from 9 of these. After May 8, it was decided that only fish larger than 4 pounds be tagged, as smaller fish would probably not enter into the landings of the commercial fishery during the forthcoming skipjack season. Because of the general scarcity of large fish during the cruise (this was also experienced by the commercial skipjack fishermen), the rate of tagging was greatly reduced thereafter. Several fast-biting schools of small skipjack were chummed to the vessel but were abandoned because of their unsuitable size for tagging.



JOHN R. MANNING CRUISE 35 (APRIL 16-MAY 14, 1957).

On May 10, 71 pounds (about 10 buckets) of a mixture of bait-size tilapia and a few mosquitofish (*Gambusia affinis*) were obtained and acclimatized during the night to sea water. Five pounds (less than 1 bucket) died during the night; most of these were mosquitofish. The tilapia survived the trip in the bait-well until they were used to chum 2 schools on May 12.

One school failed to respond to tilapia and finally sounded after 3 passes were made. The second school was located under a floating log and consisted of a mixture of dolphin (*Coryphaena hippurus*), small yellowfin tuna, and skipjack tuna, the latter ranging in weight from 3 to 7 pounds. Two passes were made on the school using tilapia, and some fish responded by surfacing. However, the response was not nearly as good as when anchovy (*Stolephorus purpureus*) was used as chum. A total of 47 skipjack were tagged from this school, but most of the fish were taken when anchovy was chummed. That the skipjack feeds readily on tilapia was shown by the stomach contents of fish taken from this school. All of the stomachs examined contained several tilapia.

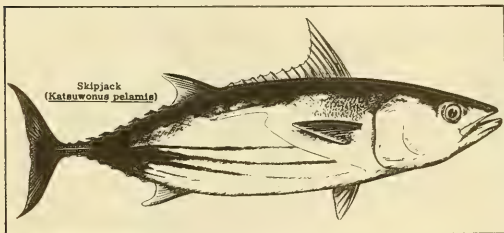
The tag used during John R. Manning and the Charles H. Gilbert cruises is a new type and used on a large scale in Hawaii for the first time this year. It consists of a barbed spearhead of clear plastic attached to a 3-inch piece of red or blue plastic tubing, the flattened end of which bears a serial number. In applying the tag, the barbed end is simply jabbed into the back muscles of the tuna and the tubing is left protruding from the wound. This speed and ease of application are important, for skipjack struggle hard and die quickly when taken from the water. Skipjack fishermen in Hawaii customarily "wing" their fish, that is, they raise the bamboo fishing pole with the right arm and as the tuna, which may weigh nearly 30 pounds, swings in toward them, they receive it under the left arm and hold it tightly while they remove the hook. This affords a perfect opportunity for applying the dart-type

tag and makes it possible to drop the marked fish back into the sea without their ever having touched the deck. Recaptures of fish marked in earlier small-scale experimental taggings with the dart tag have indicated that the tagging wound heals readily, anchoring the barb securely in the tissues of the fish.

Three skipjack released during the tagging cruises were recaptured by commercial fishing vessels on May 16 and 17. The fish had been at liberty for periods of only 4 to 11 days and were recovered at distances of 30-50 miles from the points of release. It is hoped that more recaptures, covering longer periods of time and greater portions of the skipjack's migratory paths, will be made as the season gets into full swing.

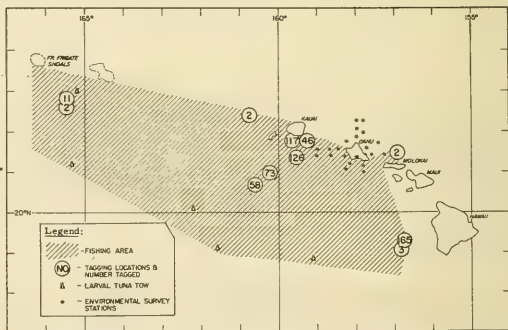
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MORE SKIPJACK TAGGED IN HAWAIIAN AREA (M/V Hugh M. Smith Cruise 39): A total of 615 skipjack tuna (aku) were tagged and released between the Hawaiian Islands of Oahu and Kauai and French Frigate Shoals. The tagging was done by biologists aboard the Service's research vessel Hugh M. Smith during a cruise which began April 19 and ended March 30. This brings the number of skipjack tagged this season to approximately 2,000. The fish were tagged with a plastic dart or "harpoon" tag developed by the Service biologists in Hawaii. The cruise of the Hugh M. Smith completed a series of three tagging cruises by the three Service research vessels operating in Hawaiian waters.



The primary purpose of the cruise was to tag and release skipjack tuna in the area south of the areas fished by the commercial fishermen as a means of tracing the movement of the tuna into the fishery. In addition, environmental surveys were made in the vicinity of Oahu Island.

Skipjack tuna were tagged and released in the area south of the major fishery and also within the area of the fishery (see chart). Three factors contributed to the failure to release large numbers of tagged skipjack at a considerable distance from land: (1) scarcity of skipjack greater than 2 pounds in weight, (2) bad weather during the early portion of the cruise, and (3) high bait mortality. Over the entire area outlined on the chart, schools of small skipjack were abundant. Many of the schools listed as unidentified may have been skipjack of about 1-2 lbs. in weight, but could not be positively identified as such. Only 12 of the schools were identified as skipjack of greater than 10 pounds.



HUGH M. SMITH CRUISE 39 (APRIL 19-MAY 30, 1957).

Activities during the cruise included 18 days spent in scouting for and catching bait. Thirty-eight bait sets resulted in a catch of 348 buckets of iao (Pranesus insularum) and 236 buckets of nehu (Stolephorus purpureus). During the twenty-one days spent scouting and fishing, 42 schools, identified as skipjack (Katsuwonus pelamis) were sighted plus 91 other schools which were unidentified. The 13 schools

fished yielded 713 skipjack tuna and a few yellowfin tuna and frigate mackerel. The majority of the catch of skipjack tuna (533 fish) were small or under five pounds in weight.

The most probable explanation of the seasonal appearance of large numbers of 18- to 22-pound skipjack in the Hawaiian fishery is a movement of these fish into Hawaiian waters from some more distant area. Skipjack tagged a considerable distance offshore and later recaptured by commercial fishermen will reveal at least a part of the path followed by the schools in their migrations. Previous attempts to carry out this work have been hampered by lack of a suitable tag. The dart tag now being used is inserted near the second back fin and has a tubular plastic streamer which protrudes about three inches. These streamers may be white, red, or blue in color and have a number near the end. Persons catching skipjack with such a tag may obtain information as to where and when the fish was tagged by writing to the Pacific Oceanic Fishery Investigations, P. O. Box 3830, Honolulu. Careful measurements of the length (snout to fork of tail) of tagged skipjack should be taken, or if possible recaptured tagged fish may be held for measurement by Service personnel. Such measurements, in the case of skipjack which have been at liberty for extended periods, can furnish valuable information on the rate of growth of this species of tuna.

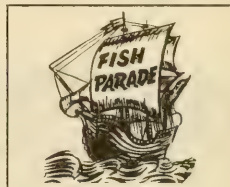
In most of the area covered by the cruise of the Hugh M. Smith, season skipjack were scarce, but small skipjack were abundant. On the last two days of the cruise large schools of season skipjack were seen north of Kaneohe Bay.



Promotion For Fishing Industry Will Stress "Fish Parade" Theme

Once a year the Fishing Industry conducts a concerted annual promotion for all domestic edible fishery products. This year National Fish Week is scheduled for September 18-28, 1957, and the theme will again be "Fish Parade." Fresh and frozen fish have been placed by the U. S. Department of Agriculture on the list of the Nation's foods in plentiful supply for September and will also be listed at the same time as a merchandising opportunity.

The U. S. Department of Interior through the Bureau of Commercial Fisheries is lending full support to "Fish Parade." Promotional fliers and special recipe fact sheets for radio, press, and television food editors, together with recorded public service radio announcements and press releases, will be some of the tools used in assisting the industry promotion. The Bureau's field staff will cooperate very closely with the industry regional and area task-force chairmen located in principle market areas over the nation. Home economists of the Bureau will be available for some radio and television demonstrations as their schedule permits.



The industry is providing point-of-sale material, window banners, shelf cards, and menu tip-ons. In addition, a retail "Fish Parade" advertisement, which appeared in the July issue of Chain Store Age, also was run in the August issues of Progressive Grocer, Frozen Food Age, and Nargus Bulletin (a publication of the National Retail Grocers Association). Restaurant "Fish Parade" advertisements



A TYPICAL MENU TIP-ON BEING USED DURING "FISH PARADE" WEEK.

were run in the August issues of American Restaurant, Restaurant Management, and Fountain and Fast Food Magazines. The Shrimp Association of the Americas ran their "Shrimp Fiesta" during the same period as the "Fish Parade." Their advertisements appeared in the August and September issues of American Restaurant, Restaurant Management, and Diner Drive-In Magazines.

General publicity on "Fish Parade" started early in July through the trade publications. However, all-out consumer publicity was scheduled to go into effect in September and to reach every section of the country.



Salmon

NATIONAL CANNED SALMON WEEK: The industry's promotion of canned salmon this year occurred during August 23-30 when the new season's salmon pack entered the market. This was the first time that this promotion took place in the summer. The outlook for the canned salmon market is firm, with an active demand condition. The National Canned Salmon Week Committee in Seattle, Wash., reported that several sets of large- and small-quantity recipes with illustrations were prepared and sent out through their agency to food editors of newspapers and other publications. They also distributed menu "clip on" cards to the restaurant trade.

The Bureau of Commercial Fisheries issued two press releases in connection with the promotion; one featured a salmon sandwich recipe during National Sandwich Month in August, and the other featured a main course salmon recipe during Canned Salmon Week.

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PUBLIC HEARING ON PROPOSED PROTECTION OF SPAWNING AREAS IN SALMON RIVER DRAINAGE: The Bureau of Land Management will hold a public hearing in the Senate Chamber of the Idaho Statehouse at Boise, on September 19 and 20, 1957, on a proposed withdrawal of approximately 31,000 acres of national forest lands at the headwaters of the Salmon River in Idaho, the Department of the Interior announced July 11. The hearing will begin at 10 a.m., local time.

According to the United States Fish and Wildlife Service, who requested the withdrawal, the lands would be withdrawn from entry under the mining laws for the benefit of valuable salmon and steelhead spawning areas, including the only known spawning area for sockeye salmon in the Snake River Drainage. The lands embraced by the proposed withdrawal are located in Bear Valley and Marsh Creeks of the Middle Fork of the Salmon River and Valley Creek, Redfish, Pettit, and Alturas Lakes, and the headwater reaches of the Salmon River within the Challis, Boise, Salmon, and Sawtooth National Forests.

The Bureau of Land Management Director said that the public hearing was being held to give local citizens and other interested persons an opportunity to hear all the facts about the proposed withdrawal and to express their opinions on it. The hearing

will be conducted by the Idaho State Supervisor of the Bureau of Land Management, who will act as chairman. A complete description of the lands affected by the proposed withdrawal was published in the Federal Register on December 22, 1955.

The meeting will be open to anyone interested.

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REGULATIONS FOR INDIAN SALMON FISHING ON COLUMBIA RIVER: An understanding has been reached with three tribes for the regulation of Indian fishing at usual and accustomed fishing places on the Columbia River below The Dalles Dam, the Oregon Fish Commission and Washington Department of Fisheries announced on June 28, 1957.

The Yakima, Umatilla, and Warm Spring tribal organizations have agreed to the following stipulations: (1) dip-netting for salmon will be permitted below the Dalles Dam in 1957, but other forms of fishing are prohibited; (2) commercial dip-netting in the area will be permitted only during the times when it is lawful to fish commercially in the main Columbia River below Bonneville Dam; (3) subsistence dip-netting will be permitted during commercial closures, but not for sale to tourists or others; (4) storage of fish taken during subsistence fishing periods for sale during commercial open seasons will be prohibited.

The tribal organizations will cooperate in enforcing the agreement and initiating a system for recording subsistence catches.

In addition, both the State agencies and tribes reserved the right to adjust their positions according to future legal and conservation determinations, and the States agreed not to adopt closures which would have the effect solely of limiting the Indian dip-net fishery.

The conservation agreement evolved from an initial conference May 3, 1957, among tribal counsel and representatives of the two State agencies, the attorney general offices, and district attorney of Wasco County, regarding the fate of historic Indian fisheries that have been erased or changed by completion of The Dalles Dam. For the first time commercial gill-netting is prohibited above Bonneville Dam, and dip-netting is impossible at Celilo Falls because of the power dam impoundment.

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SALMON TAGGING IN NORTH PACIFIC TO BE CONTINUED: The U. S. Fish and Wildlife Service has renewed its contract with the University of Washington to tag salmon in the waters of the North Pacific, according to a July 14 announcement by the Secretary of the Interior. The new contract covers the period July 1, 1957, to June 30, 1958, and is in the amount of \$258,000.

The Director of the Bureau of Commercial Fisheries, who signed the contract for the Government, said the work is being done on behalf of the United States section of the International North Pacific Fisheries Commission created by the treaty of June 12, 1953, among the United States, Canada, and Japan.

The University has been working since 1955 on this project to develop basic information on the distribution and migratory pattern of North Pacific salmon.

The program, in addition to extensive ocean tagging of salmon, includes study of the scientific literature as to tags, tag methods, and analysis of results; improvement of tags, methods, and of fish handling; further development of techniques of distinguishing sex in live tagged fish; studying the distribution of both mature and

immature salmon; development of methods of catching fish for tagging, analyzing results, and preparing reports.

The contract covers staff, equipment, supplies, and the chartering of three vessels to handle the operation at sea. It also provides that inventions or discoveries of processes, devices, and methods conceived and developed as a result of the contract shall become the property of the Government.

Work under the contract will be handled through the regional office of the U. S. Fish and Wildlife Service at Portland, Ore.

The award of 17 other contracts by the Service for special research, biological investigations, and economic studies in the commercial fisheries field was announced recently. The 18 contracts involve a total of \$840,600. (See pp. 40 and 41 of this issue.)



Saltonstall-Kennedy Act Fisheries Projects

FISHERY RESEARCH CONTRACTS AWARDED: Seventeen contracts for research, biological investigations, and economic studies have been awarded by the United States Fish and Wildlife Service early in June, the Secretary of the Interior announced on June 10, 1957.

The projects are part of the continuing programs conducted by the Service to assure a sustained supply of fish and to provide for better utilization of fish and fishery products. Money for these contracts was provided through the Saltonstall-Kennedy Act of 1954 which makes available a portion of foreign fisheries import duties to carry out research on means of strengthening the American fishing industry.

Secretary Seaton was advised by Ross L. Leffler, Assistant Secretary for Fish and Wildlife, that in some of the contracts, fishery biologists seek data which would help the Service guard against over-use of a resource. Other contracts would help the Service predict fluctuations in fish populations or perhaps eliminate or modify the fluctuations; three of the contracts deal with fishery economics and certain conditions which affect the systematic harvesting of a resource. Some contracts relate to the "atoms for peace" program by studying the use of radiation in fish preservation, while still others deal with chemical studies of fish oils which may result in new uses for those oils.

Species being studied biologically include salmon, king crab, blue crab, shrimp, and menhaden. The economic studies are being made on Pacific halibut, Maine fish and shellfish, and a third study is on the effect of price changes on several selected varieties of fish and shellfish.

There are four other contracts which relate specifically to the Alaska salmon fishery and one to Alaska's king crab. All salmon contracts are with the University of Washington and include tagging salmon in Cook Inlet and Prince William Sound, \$45,000; tagging salmon off Prince of Wales Island, \$35,000; observations of red salmon on the Kvichak River system, \$56,700; cataloging streams in Southeastern Alaska, \$15,000. The University of Southern California has the contract to study the king crab in the Cook Inlet area. This is a two-year project for \$62,400.

The research contract with the Gulf Coast Research Laboratory of Ocean Springs, Miss., is for a three-year \$100,000 project to determine whether the menhaden in the Gulf of Mexico are all of one race or of many races. Biol-

ogists consider this knowledge essential for any scientific study of the resource, since fish of various races of the same species are apt to react differently to a given set of conditions.

The ultimate objective of this menhaden study is to help the biologists predict fluctuations in the menhaden supply. There is no apparent threat to the menhaden fishery, biologists say, but add that they prefer to make the necessary studies while the fishery is in a healthy condition. In the late 1800's menhaden was one of the best fisheries in the New England area. Then it suddenly disappeared and did not reappear in those waters until five years ago.

Tulane University of New Orleans has an \$11,000 14-months contract to study the larvae and young of the menhaden, another phase of the work which will be used in management plans for the resource.

With Tulane also the Service has placed a contract for \$14,000 for a study of the anatomical differences between the white and brown shrimp. Biologists believe that close scrutiny of the anatomy of the shrimp will give them valuable clues to the habits and life history of that shellfish.

Among the contracts awarded on the use of radiation in the preservation of fish are those to Florida State University and Oregon State College. Florida State will have \$14,200 to study the effects of radiation on blue crab meat and Oregon State will have \$13,000 for ionized radiation on Pacific Coast shellfish and smoked fish.

The Fish and Wildlife Service has already devoted considerable effort to studying the use of radiation for fish preservation. It has projects under way at each of its five laboratories and has additional contracts with Massachusetts Institute of Technology, Food Chemical Research Laboratories, and Maryland State College.

The present study is primarily a screening operation designed to select for possible initial commercial utilization those of the nearly 200 edible species of fish that are most adaptable to the proposed new processing methods. One technique is high-level radiation, or "cold sterilization," which kills all bacteria; the other is low-level radiation, or radiopasteurization, which kills most of the bacteria.

There are three contracts with the University of Minnesota included in the group just awarded. These are: research on the use of derivatives from fish oil, \$15,000; determination of the structure of the saturated and unsaturated acids of fish oil, \$13,900; and the study of the chemistry of the odor problem in fish oil, \$13,000.

A laboratory study of the blue crab will be made by the Oyster Institute of North America. This is a two-year project and will cost \$80,000. The factors which affect survival of the larvae and young crabs will be studied. The effects of temperature, the changes in chemical composition of the water, and salinity will be considered. The findings will be related to natural conditions in an effort to learn whether or not there is some way by which the resource can be protected against the vagaries of nature, or by which these effects can be prevented.

One of the contracts dealing with fishery economics is with the University of Washington which will study the possible economic impact of Government fishing regulations and industry-imposed regulations upon the Pacific halibut fishery. Severe fluctuations of boatside prices in 1953 compared with the relatively stable boatside prices in 1956 will be the basis for the study. It is suspected that the 1953 price fluctuations were severely influenced by supplies coming to the docks faster, at times, than the halibut could be economically handled and directed into the channels of trade.

During the 1956 season the halibut fishermen established a fleet rotation system which resulted in a steady flow of halibut into the various facilities, with a greater stabilization of the price structure. The Service is asking that all factors affecting both the stable and unstable price structures be documented. The cost will be \$39,700 spread over a two-year project.

The interrelationships of biologic and economic forces upon fishery resources are being studied by the Department of Sea and Shore Fisheries of Maine. The study will seek, for example, to determine what effect price declines in one fishery have upon the harvest of the resources of another in that area. In addition, research will be made on the effects of a failure in a particular fishery resource upon the prosecution of other fishery resources. This is a \$25,000 contract.

Rutgers University of New Jersey has been awarded a contract for \$29,700 for a two-year economic study to determine the basic factors that affect demand and prices paid for principal species of fish and shellfish. Such information assists fishermen and fishery products distributors in making more informed decisions on how their products should be priced to effect the greatest amount of profitable sales. The study will include canned tuna; fresh, frozen and canned salmon; fresh and canned oysters; and fresh Atlantic blue crab.



School-Lunch Program

SCHOOL-LUNCH PROGRAM WORKSHOPS, SUMMER 1957: With the end of the school year, school-lunch personnel assembled in various localities to attend summer workshops.

Home economists and fishery marketing specialists of the Bureau of Commercial Fisheries attended these workshops and demonstrated to the school-lunch personnel how to prepare appetizing, economical, nutritious, and easy-to-prepare fish dishes. The recipes used in these demonstrations are developed in the Bureau's institutional test kitchen at College Park, Md. Special attention is given in developing these recipes to provide 2 ounces of cooked fish per serving so that they meet the Type-A School Lunch requirements.

The fish featured in these demonstrations must be plentiful, low in cost, and easy to prepare. Included are frozen fillets or fish portions--ocean perch, cod, or haddock; canned fish such as tuna, mackerel, and flaked fish; and precooked fish such as frozen fish sticks.

The Bureau scheduled 24 school-lunch demonstrations at the following summer workshops: June 11--Morris, Minn.; June 18--Waseca, Minn.; June 20--Columbus, Ohio; June 20--Pullman, Wash.; June 26--Farmville, Va.; July 9-12--Lubbock, Tex. (4 demonstrations); July 16-18--Stillwater, Okla. (3 demonstrations); July 23--Grand Rapids, Minn.; July 23-25--Stillwater, Okla. (3 demonstrations); August 5-7--Santa Fe, New Mex. (3 demonstrations); August 16--Seattle, Wash.; August 20-22--Kingsville, Tex. (3 demonstrations); August 27--South Bend, Ind.



Shrimp

ICE-HOLDING UNITS FOR VESSELS: One of the chief concerns of vessels shrimp trawling in the Campeche area of the Gulf of Mexico is the need for sufficient ice and fuel capacity to allow the vessel to remain on the fishing grounds for a prolonged period. The time consumed in steaming back to port to refuel and re-ice cuts heavily into the fishing time and results in a lower profit to the vessel owner and crew.

There have been many innovations applied to the Campeche shrimp vessels to help solve this problem, such as insulated holds, freighting catches frequently, and the borrowing of ice and fuel from other vessels that have completed a trip. However, there is one single adaptation that has proven to be a solution of the problem of sufficient ice for a long trip and has enabled the shrimp vessels to nearly double their fishing time. This is the "Ice Holding Unit," which is not a freezer, but rather a single-unit refrigerator of $\frac{3}{4}$ - to 1-ton capacity with six plates or series of coils in the hold. The cost of these units is very reasonable and will hold ice adequately for a 40-day trip.

These units create a temperature cold enough to form a crust on top of the ice and when this crust is broken the ice is found in the gravelly condition desired for icing shrimp.

Many shrimp vessel owners claim that the refrigerator units are necessary for profitable shrimp fishing on distant grounds.

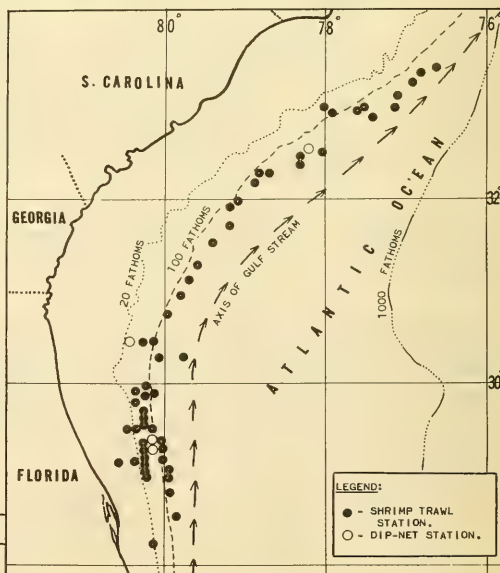


South Atlantic Exploratory Fishery Program

EXPLORATORY DEEP-WATER SHRIMP TRAWLING ALONG SOUTH ATLANTIC COAST (M/V Combat Cruise 9, April 18-June 4, 1957): The Atlantic Ocean offshore areas between Cape Fear, N. C., and Cape Canaveral, Fla., were surveyed by the Service's chartered vessel *Combat* for possible shrimp fishing grounds. Although the survey period extended from the latter part of April to the early part of June, most of the month of May was lost due to engine trouble.

During April, 33 drags were made southward from Cape Fear, N. C., to Cape Canaveral, Fla., in depths of 150 to 250 fathoms. North of Beaufort, S. C. ($32^{\circ}22'N$. latitude), catches contained small numbers of 40-60 count heads-on *Penaeopsis megalops*, but no royal-red shrimp, *Hymenobaeus*

M/V COMBAT CRUISE (APRIL 18-JUNE 4, 1957)



robustus. South of Beaufort to off the St. Johns River, Fla., small numbers of royal-red shrimp were caught in most drags. Bad trawling bottom was found throughout this area. The largest catch was made off Daytona Beach, Fla., in 210 fathoms where 75 pounds of mixed sizes were picked up in a 3-hour drag.

Ten drags were made in 175-225 fathoms between St. Augustine and Cape Canaveral, Fla., during May 29-31. Bad weather and strong currents greatly hampered fishing operations and catches were poor. It was learned that a commercial vessel had caught over 1,200 pounds (heads-off) of royal-red shrimp in a 24-hour period in this area the previous week.

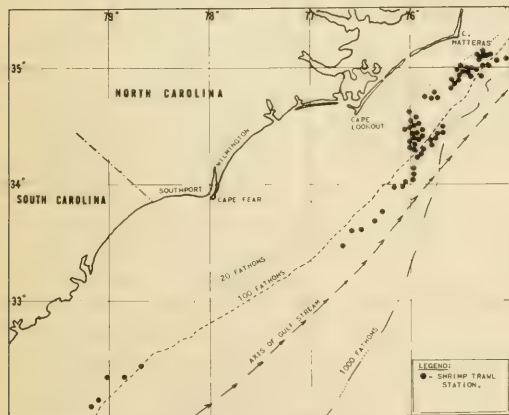
A total of 19 drags with a 40-foot flat trawl were made in 18-38 fathoms between Cape Canaveral and Jacksonville, Fla. (June 1-4) exploring for rock shrimp, Sicyonia brevirostris. Most catches contained small numbers. The best catch was 70 pounds of 35-count (heads-on) rock shrimp, in 32 fathoms off Flagler Beach, Fla. Night catches in 28-35 fathoms between New Smyrna and Flagler Beach, Fla., had about two pounds each of very large (10-15 count heads-on) pink shrimp (Penaeus duorarum).

Large numbers of small scallops (Pecten gibbus) were caught in most of the shallow drags. A 15-minute drag east of Canaveral picked up about 2½ bushels.

Trolling captures offshore included one blackfin tuna, one little tuna, two king mackerel, and numerous dolphin.

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CAROLINA COASTS SURVEYED FOR DEEP-WATER SHRIMP (M/V Combat Cruise 10, June 12-26, 1957): Deep-water trawling off the coasts of North and South Carolina yielded only small catches (up to 3 pounds of 25- to 40-count heads-off shrimp a drag) of royal red shrimp (Hymenopeneus robustus).



M/V COMBAT CRUISE (JUNE 12-26, 1957).

Most of the work was carried out in the offings of Cape Lookout, S. C., to Cape Hatteras, N. C. where shrimp explorations had been requested by the North Carolina Fisheries Association. A total of 74 drags were made using 40-foot flat shrimp trawls--28 drags were made in depths of 170-225 fathoms, 14 in 50-100 fathoms, and 32 in 25-49 fathoms.

Deep-water dragging yielded very small catches of royal-red shrimp at 8 of the 28 stations. Varying quantities of 40-60 count heads-on Penaeopsis meg-alops were present in most drags. The best drag contained about 40 pounds (heads-on) from a depth of 200 fathoms. Many

drags were interrupted due to signs of bad bottom on the depth recorders, and 6 trawls were lost or badly damaged.

Special effort to explore for shrimp in the 25-100-fathom area between Cape Lookout and Cape Hatteras was requested by the Association. Six transects involving 36 drags were made in this area. Small quantities (less than one pound) of

pink shrimp (*Penaeus duorarum*) were caught in two drags, in 25 and 40 fathoms. Varying numbers of rock shrimp (*Sicyonia brevirostris*) were caught in most of the drags inside of 50 fathoms. The largest catch contained about 40 pounds (heads-on). Except for a few scattered red snapper and grouper, no other species of commercial importance were caught.

On the return trip, 6 drags were made in 21-35 fathoms off the South Carolina coast. These drags yielded rock shrimp at rates of one to two pounds an hour.

Trolling captures during the trip included 2 white skipjack tuna, 1 wahoo, and 50 dolphin. The two skipjack were caught from a large school sighted off Cape Lookout.



Tuna

TAGGED YELLOWFIN TRAVELS 900 MILES: The tuna-tagging program of the California Department of Fish and Game once again has demonstrated that this fish is one of the widest ranging species in the Pacific Ocean.

A yellowfin tagged March 8, 1957, off Acapulco, El Salvador, was caught two months later off Manzanillo, Mexico, a movement of 900 miles.

Tuna tagged by the Department have been recovered by fishermen in mid-Pacific ocean and as far west as the coastal waters of Japan.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, APRIL 1957: United States imports of edible fresh, frozen, and processed fish and shellfish in April 1957 were lower by 7.7

United States Foreign Trade in Edible Fishery Products,
April 1957 with Comparisons

Item	Quantity			Value		
	April			Year		
	1957	1956	1956	1957	1956	1956
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish:						
Fresh, frozen & processed ¹ . .	62.6	67.0	786.6	17.2	17.7	231.6
Exports:						
Fish & shellfish:						
Processed ¹ only (excluding fresh & frozen) .	3.2	3.8	82.8	0.7	0.8	19.2
¹ INCLUDES PASTES, SAUCES, CLAM CHOWDER AND JUICE, AND OTHER SPECIALTIES.						

percent in quantity and 16.1 percent in value as compared with the previous month. Compared with April 1956, the imports for April this year were down 6.7 percent in quantity and 2.8 percent in value. The value of imports for April 1957 averaged 27.5 cents a pound as compared with 26.4 cents a pound for the same month in 1956.

April 1957 imports dropped as compared with March due chiefly to lighter imports of fillets other

than groundfish, shrimp, canned sardines, and spiny lobster tails.

Exports of processed edible fish and shellfish in April 1957 decreased about 59.5 percent in quantity from the previous month and were also 15.8 percent under April 1956. The April 1957 value of these exports was lower by 50.0 percent as compared with the previous month, and down 13.5 percent from the same month a year ago.

From March to April 1957 there was a sharp drop in canned mackerel exports and substantial declines in the exports of canned sardines and canned salmon.

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GROUNDFISH FILLET IMPORTS, JUNE 1957: During June 1957, imports of groundfish fillets (including ocean perch) and blocks amounted to 10.2 million pounds. Compared with the same month last year, this represented an increase of 2.6 million pounds or 35 percent. This gain was due primarily to a 1.7-million-pound increase in imports from Iceland. Canada, Norway, and the Netherlands showed a total increase of 1.1 million pounds, compared with those reported for the same month last year. There were smaller imports from Denmark, France, and West Germany.

Imports of groundfish and ocean perch fillets and blocks into the United States during the first six months of 1957 totaled 66.5 million pounds--an increase of only 12,000 pounds as compared with the corresponding period of 1956. Canada led all other countries exporting fillets to this country with 48.6 million pounds, followed by Iceland with 12.6 million pounds. These two countries supplied 92 percent of the total imports for the first six months of 1957. The remaining 8 percent was accounted for by Norway, Denmark, the United Kingdom, the Netherlands, France, West Germany, and Miquelon and St. Pierre.

NOTE: SEE CHART 7 IN THIS ISSUE.

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IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, APRIL 1957: Imports: **GROUNDFISH:** Fillet imports of 7.3 million pounds during April 1957 were 31 percent less than in that month of 1956. Imports of fillet blocks and slabs in April totaled 5 million pounds, 75 percent more than in the same month a year ago.

Groundfish fillet imports during the first four months of 1957 totaled 30 million pounds, a decline of 17 percent from the similar period of 1956. Imports of blocks and slabs in the same period reached 17 million pounds, an increase of 43 percent.

FROZEN TUNA: April imports totaled 12.1 million pounds, 2 percent more than in April 1956. During the first four months of 1957, 49 million pounds were imported, a gain of 8 percent over the similar period of a year ago. Of the 49 million pounds, 21.5 million pounds were albacore (43 percent more than a year ago) and 27.3 million pounds were other tuna (9 percent less than a year ago).

CANNED TUNA: Almost 4 million pounds were imported during April, a gain of 25 percent over the same month of 1956. Imports of 12.4 million pounds during the first four months of 1957 gained 17 percent over the same period in 1956.

CANNED BONITO: Imports of 1.4 million pounds in April were 18 percent greater than in that month a year ago. Imports during the first 4 months of 1957 totaled 5.4 million pounds, 4 percent less than in the same period last year.

CANNED SALMON: April imports of 704,000 pounds were 79 percent less than in that month a year ago. Total imports for this year through April totaled 6.9 million pounds, 29 percent less than in the comparable period of 1956.

CANNED SARDINES: April imports of 1.1 million pounds were 24 percent less than in April 1956. Total imports for this year through April of 6.9 million pounds were 3 percent greater than for the first four months last year.

SWORDFISH: April imports of 1.1 million pounds were 19 percent less than in the same month a year ago. Total imports during the first four months of this year were 8 percent less than in 1956 through April.

SHRIMP: The 4.5 million pounds imported in April this year were 40 percent greater than in April 1956. Imports for the first four months of 1957 of almost 20 million pounds were down 13 percent from the comparable period of 1956.

LOBSTERS: April imports of 2.7 million pounds were 18 percent less than in April a year ago. Imports during the first four months of 1957 were 12 percent greater than in that period of 1956.

CANNED CRABMEAT: Imports totaled 530,000 pounds this April, a gain of 22 percent over that month of 1956. Total imports during the first four months of this year of 1.6 million pounds were 5 percent less than during that period of 1956.

FISH MEAL: Imports of 9,480 tons during April were 25 percent less than in April 1956. Imports during the first four months of 1957 of 32,111 tons were 20 percent less than in the same period of the previous year.

Exports: CANNED SARDINES: April exports of 873,000 pounds were 38 percent less than during April 1956. Exports of 7.3 million pounds during the first four months of 1957 were 62 percent less than during that 1956 period.

CANNED MACKEREL: April exports totaled 582,000 pounds, a sharp decline compared with the 4.3 million pounds exported during March of this year. Exports during the first four months of 1957 totaled almost 10 million pounds.

FISH OILS: Exports of 13.4 million pounds in April this year were almost three times greater than in April 1956. Total exports during the first four months of 1957 of 48.7 million pounds were 17 percent greater than during the same period of 1956.

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TUNA CANNED IN BRINE IMPORTS UNDER QUOTA PROVISIO: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1957 at the $12\frac{1}{2}$ -percent rate of duty is limited to 44,528,533 pounds. Any imports in excess of that quantity will be dutiable at 25 percent ad valorem.

Imports under the quota from January 1-June 1, 1957, amounted to 15,667,098 pounds, according to data compiled by the U. S. Bureau of Customs. This leaves a balance of 28,861,435 pounds of the quota which may be imported during the balance of 1957 at the $12\frac{1}{2}$ -percent rate of duty.



Virginia

OYSTER LOSSES THIS SUMMER PREDICTED BY BIOLOGISTS: Planters may experience above-normal oyster deaths this summer in Virginia if the present weather conditions continue, say biologists at the Virginia Fisheries Laboratory at Gloucester Point. The biologists have found that the death rate of oysters rises sharply in summer. Careful studies in the past six years have shown that when the warm summer period is unusually long, especially when it follows a mild winter, the mortality is greater than usual. Most of these summer deaths are caused by a fungus, Dermocystidium, which attacks oysters in warm weather. The fungus is not harmful to man.

These findings are extremely important for Virginia's oyster planters. The normal death rate is about 25 to 30 percent a year, but in some summers as many as 50 percent may die. Such a year was 1954, when a long hot summer followed a

relatively warm winter. Much of the blame for the poor oyster harvests of 1954/55 and 1955/56 must be placed on these warm-weather deaths, say the biologists.

The cold winter of 1955/56 and mild summer of 1956, on the other hand, reduced the oyster death rate to the lowest on record. In 1956 less than 20 percent of oysters in the Chesapeake Bay area died, and this was an important factor in the improved yields of the past oyster season in Virginia.

The hot weather of May and June this year brought water temperatures to the highest levels yet observed so early in the season by the Laboratory staff. Last winter, though it included an unusual cold snap in January, was warmer than average. Summer deaths of oysters began 2 to 3 weeks early following this unusual warmth. Serious losses can be expected if temperatures continue higher than normal and particularly if the warm season persists into the early fall.

Planters who harvested all their marketable oyster crops last winter and spring are fortunate, for they probably would fare much worse if they had left their oysters on the grounds for another season. The effects of newly-planted seed are not severe, the biologists say, for they have found that seed from the James River escapes most of the hot-weather mortality in its first summer on planted ground in the Bay.

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UPPER RAPPAHANNOCK RIVER HAS ADVANTAGES FOR OYSTER PLANTING: Unseasonably hot summer weather following a warm winter may cause unduly high oyster losses on planted grounds, according to a recent release from the Virginia Fisheries Laboratory at Gloucester Point.

These losses may be expected only on grounds where the water is fairly salty, such as Hampton Roads, the York River, the lower Rappahannock, and Chesapeake Bay itself.

Six years of study of oyster mortality at the State Laboratory have shown that in fresher waters, such as the James River seed areas, the upper Rappahannock, and most of the Maryland waters of the Bay, oyster deaths are not usually hastened significantly by warm weather. This is explained by the absence of the fungus Dermocystidium which attacks oysters in salty waters.

The Rappahannock River is subject to occasional mortality from another cause, however, which brought about the catastrophes of 1949 and 1955. When extremely heavy rains increase the runoff in the River in hot weather, the supply of dissolved oxygen is quickly used up. The oysters may smother, or may be killed by toxic substances formed by bacteria in the absence of oxygen.

Because hot weather deaths are usually low and screwborers are absent in the upper Rappahannock, the yield on planted grounds is usually better than in most other planting areas. But the catastrophic mortalities that occur occasionally from other natural causes create much hardship because they are sudden and unpredictable. These are the hazards that oystermen must face.



Wholesale Prices, June 1957

The change in the over-all edible fish and shellfish (fresh, frozen, and canned) wholesale price index (117.2 percent of the 1947-49 average) from May to June 1957 was less than one percent. But the June 1957 index was 6.8 percent higher than the same month in 1956.

From May to June, higher prices for three fresh-water varieties and Pacific Coast Halibut (due primarily to a change from frozen to fresh halibut prices) more than offset a slight decline in Pacific Coast salmon and drawn haddock prices and a more substantial decline (6.7 percent) in Lake Superior drawn whitefish prices. The June 1957 index for the drawn, dressed, or whole finfish subgroup went up 3.1 percent over May. Compared with the same month a year ago, the June subgroup index was higher by 4.6 percent. Fresh halibut and salmon prices were lower this June as compared with June 1956, but increases of 3.5 to 35.9 percent in the other five items more than offset these declines. The shortage of good quality Great Lakes whitefish, yellow pike, and lake trout this year as compared with last were reflected in the high prices which prevailed this June.

Fresh processed fish and shellfish prices in June were down slightly (1.8 percent) from the previous month because of a drop of about 6.2 percent in fresh haddock fillet prices at Boston and a 2.6 percent drop in fresh shrimp prices at New York City. All fresh processed fish and shellfish items in this sub-

group were higher (up 10.1 percent) in June this year than in the same month a year ago.

There was very little change (down 0.6 percent) in the wholesale prices for the frozen processed fish and shellfish from May to June. Frozen haddock and ocean perch fillets at Boston were lower by one cent a pound in June as compared with May. However, this subgroup index this June was higher by 16.1 percent than for the same month in 1956 principally because frozen shrimp prices at Chicago were almost 26 percent higher this June than in the same month of 1956.

Canned fishery products in June remained at the same level as prevailed the preceding May and April. But this subgroup index was 2.5 percent higher than in the same month of 1956 because of higher prices for canned light meat tuna (up 5.8 percent) and California sardines (up 20 percent). On the other hand Maine sardine prices were lower by 6.2 percent this June as compared with June a year ago because this year's pack through June was larger. The packing seasons for Maine sardines and Pacific salmon were gaining momentum as June ended, but packs were still too light to indicate the seasonal price trend. Canned tuna packed from domestic-caught fish was falling behind a year ago, but heavy inventories of canned white meat tuna, plus continuing pressure from both imported canned white meat and frozen tuna keeps the market for all types of canned tuna just about steady.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, June 1957 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/} (\$)		Indexes (1947-49=100)			
			June 1957	May 1957	June 1957	May 1957	Apr. 1957	June 1956
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					117.2	117.0	2/119.4	109.7
Fresh & Frozen Fishery Products:					128.5	128.2	2/132.2	117.5
Drawn, Dressed, or Whole Finfish:					111.2	107.9	2/120.0	106.3
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.08	.08	76.5	77.4	110.0	56.3
Halibut, wgt., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.33	.29	100.6	89.0	92.3	107.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.62	.65	139.3	145.2	134.8	144.4
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.67	.67	154.9	166.1	2/229.3	131.4
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.88	.80	176.9	161.8	227.5	139.5
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.60	.52	121.9	106.5	163.9	117.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.44	.35	102.0	82.1	75.0	78.6
Processed Fresh (Fish & Shellfish):					140.6	143.2	140.4	127.7
Fillet, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.30	.32	102.1	109.9	120.8	85.1
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.94	.96	147.8	151.7	143.8	129.3
Oysters, shucked, standards	Norfolk	gal.	5.75	5.75	142.3	142.3	142.3	136.1
Processed, Frozen (Fish & Shellfish):					130.1	130.9	130.9	112.1
Fillet, Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	103.4	103.4	103.4	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.29	.30	91.0	92.6	92.6	86.3
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.29	112.8	114.8	114.8	110.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.95	2/.95	145.8	145.8	145.8	116.1
Canned Fishery Products:					101.2	101.2	101.2	93.7
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.65	22.65	120.0	120.0	120.0	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.20	11.20	80.8	80.8	80.8	76.4
Sardines, Calif., tom, pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	9.00	9.00	105.0	105.0	105.0	87.5
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	cs.	7.70	7.70	81.9	81.9	81.9	87.3

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs.

These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

^{2/}Revised.



International

WORLD FISH OIL EXPORTS UP SLIGHTLY IN 1956: World fish oil exports (including fish-liver oils) in 1956 are estimated to have been slightly higher than in 1955, but slightly lower than the record volume exported in 1954.

Fish Oils (including fish-liver oils); World Exports from Specified Countries and Estimated World Total (average 1935-39 and 1945-49, annual 1954-56)					
Continent and Country	1956 ^{2/}	1955 ^{2/}	1954 ^{1/}	Average	
				1945-49	1935-39
				(1,000 Short Tons)	
North America:					
Canada	9.3	9.3	7.9	7.7	12.0
United States	70.4	71.3	70.8	8.3	1.2
Europe:					
Denmark	9.7	14.2	11.0	.6	2.5
West Germany	9.3	16.5	7.7	-	3/ 4.4
Iceland	21.3	16.3	20.6	27.1	24.5
Netherlands ^{4/}	9.1	5.4	10.4	.6	.2
Norway	42.2	20.9	26.6	23.5	38.0
Portugal	4.7	5.5	6.0	1.7	5/
United Kingdom	3.8	4.4	3.5	3.8	6.0
Other:					
Angola	5.7	6.3	12.6	1.4	.7
Japan	5.0	10.2	10.4	6/ .7	35.0
Union of South Africa	5.4	13.3	10.5	1.7	2.2
World Total ^{7/}	210.0	205.0	215.0	85.0	135.0
^{1/} Revised. ^{2/} Preliminary. ^{3/} Prewar Germany. ^{4/} May include some whale oil. ^{5/} Not available. ^{6/} Less than 5 years. ^{7/} Includes estimates from minor countries.					

Norwegian exports in 1956--twice as large as 1955--reflected the year's record herring catch. Iceland and the Netherlands also had substantial increases in fish oil exports last year compared to the previous year. Exports of fish oil from most of the other countries decreased. Exports from the United States decreased slightly from 1955, which was a record year, Foreign Crops and Markets of June 24 reports.

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YUGOSLAVIA AND CANADA STUDY FREEZING SARDINES PRIOR TO CANNING: Three Canadian and four Yugoslavian research workers have collaborated in a prolonged and

comprehensive study of the benefits of freezing sardines for holding prior to canning. The sardines were caught in the North Adriatic Sea (Yugoslav sardines), processed at the Rijeka Hygiene Institute, Yugoslavia, and the canned samples were tested at the Canadian Food Inspection Laboratory at Halifax, Canada.

The objectives were to determine maximum holding periods at various temperatures, and it was concluded that freshly-caught fish should be iced within a very few hours and that holding in ice should not exceed three days. They found that glazed and unglazed air-frozen sardines can be held at 4° F. up to a month and make a good canned product, but they recommend that 20° F. be used in commercial practice (Industrial Refrigeration, June 1957).

INTERNATIONAL PACIFIC HALIBUT COMMISSION

FIRST SEASON IN AREAS 2 and 1B CLOSED: The International Pacific Halibut Commission announced the closure of the first season in Areas 2 and 1B to halibut fishing at 6 a.m. (P.S.T.) June 17, 1957, until the beginning of the second fishing season in these areas. The Commission estimated that the 26.5-million-pound limit set for Area 2 would have been caught by that date. Area 1B which has no catch limit was also closed when the quota for Area 2 was attained.

The official opening date for all halibut fishing in the Pacific regulatory area this year was May 1 at 6:00 a. m. (P.S.T.). The United States fleet sailed in time this year to commence fishing on the opening day. The Canadian fleet, on the other hand, did not sail until May 3 and started fishing about 5 days after the United States fleet. The Canadian fleet was not able to start on time because of a labor management dispute over certain fringe benefits and "lay" apportionments. In 1956 the opening date was May 12 but both United States and Canadian fishermen voluntarily agreed not to start fishing until May 20. In 1955 the official opening date was also May 12 and actual fishing started on that date.

Areas 2 and 1B this year were open to halibut fishing for 47 days as compared with 46 days in 1956. Because of the voluntary agreement to start fishing on May 20, actual fishing in 1956 took place for only 38 days. These same areas were fished for 24 days in 1955, 21 days in 1954, and 24 days in 1953.

The longer period required to catch the Area 2 catch limit is attributed to (1) the difficulty of vessels catching capacity loads early in the season, (2) the continuation of the lay-over between trips initiated in 1956 except that the period was extended from 7 to 8 days this season, and (3) the delayed start by the Canadian fleet.

The second fishing season in Areas 2 and 1B were scheduled to commence at 6:00 a. m. (P.S.T.) July 29 and terminate at 6:00 a. m. (P.S.T.) August 5, 1957. Thereafter, these areas are closed to halibut fishing until the commencement of the halibut fishing season in 1958.

Area 2 includes all convention waters between Willapa Bay, Wash., and Cape Spencer, Alaska. Area 1B includes all convention waters between Willapa Bay and Heceta Head, Ore.

Under authority of the Convention between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea, this year's regulations became effective April 10, 1957.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, MARCH 1957 P. 36, AUGUST 1956 P. 57.



Brazil

NEW FISH-PROCESSING PLANT TO BE ESTABLISHED: The Brazilian state of Para will have a new fish-processing plant at Maracana, which is located on the Atlantic Ocean and near the mouth of the Amazon River. This enterprise has been granted an initial fund of 4 million cruzeiros (about US\$48,000 at the free rate of exchange) from the Superintendencia do Plano de Valorizacao Economica da Amazonia. This contribution is to be repaid within eight years at an interest rate of 4 percent, according to a June 11, 1957, dispatch from the United States Consulate at Belem.

The new enterprise proposes to initiate a fishing industry in the Amazon valley by importing three large fishing vessels to provide fish in volume for local needs and make possible a canned fish, fish fertilizer, and a vitamin-oil industry. Plans in prospect include a plant that will have a quick-freezing capacity of 100 tons of fish and shellfish; cold storage for 950 tons of frozen fishery products; a canning plant with a capacity of 100,000 cans daily; a drying section of "pirarucu" for 26,500 pounds of the well known Arapaima gagas (somewhat like dried cod); a byproducts section with an estimated capacity of 13,800 pounds of 70-percent protein fish meal and 2,600-4,500 pounds of fish oils; and an ice-making plant with a capacity of 66,000 pounds of ice daily.

NOTE: VALUE OF CRUZEIROS IN TERMS OF US\$ ESTIMATED AT 83 CRUZEIROS EQUAL US\$1.



Canada

SALMON INDUSTRY LABOR-MANAGEMENT DISPUTE IN BRITISH COLUMBIA: Some 5,500 salmon "net" fishermen are affected by a labor-management dispute which began on June 24 in British Columbia, the Canadian press reported recently. This dispute threatens to tie-up the multi-million dollar salmon fishing and canning industry in that Province. A fishermen's union and a fisheries association cannot agree on the price of net-caught salmon. Union demands, which were rejected by the association, called for increases of between 4 to 7 cents a pound, depending on the species.

The dispute was not expected to have any serious effect on the industry until the large salmon runs which were expected to begin around July 6. A protracted tie-up would adversely affect the employment of some 15,000 workers employed in other sectors of the industry, points out a June 28 United States Embassy dispatch from Ottawa.



Chile

WHALING FACTORY FINANCED BY JAPANESE CAPITAL AUTHORIZED: A Japanese firm has been authorized to establish a new whaling factory at Corral, in Valdivia Province, by the Chilean Ministry of Economy. It is believed that the Chilean Government may authorize the foreign investment to reach the equivalent of US\$1.2 million, reports the July 8 Foreign Crops and Markets of the U. S. Department of Agriculture.



Cuba

CLOSED SEASON FOR MOJARRA AND SPINY LOBSTER ENDED: The closed season on spiny lobster that began on March 10, 1957, was lifted on June 7 in a resolution by the President of the National Institute of Fisheries. No landings, shipments, or sale of spiny lobster was permitted until June 10. The same resolution (published in the Official Gazette of June 12, 1957) lifted the closed season on mojara (broadshad) effective June 10. The closed season on mojara started March 15, 1957.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, MAY 1957 P. 51.

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CUBA SIGNS TUNA FISHING CONTRACT WITH JAPANESE

FIRM: The Cuban National Fisheries Institute signed a contract with Pesqueras Internacionales, S. A., which is the Cuban representative of the Cia. Nippon Reizo Kabushiki Kaisha, according to press reports dated June 15, 1957.

The published report infers that the contract was entered into solely in order to get Japanese technicians to teach the latest fishing methods to Cuban crews. The contract, according to the article, is for one year, involving the use of the 590-ton Sumiyosha Maru, constructed and equipped as a training ship at a cost of US\$750,000. The clipper is reportedly due in Cuba the first part of July 1957. The article does not mention the fact that the catch is to be tuna, although it does refer to exploration activities outside Cuban territorial waters, states a June 18, 1957, dispatch from the U. S. Embassy in Havana.

Other sources of information indicated that the contract with the Japanese firm is for one year with a possible extension of not more than an additional year. The Japanese would use one or possibly two tuna clippers of 300 tons capacity, each clipper remaining at sea for about a month at a time, exploring the commercial possibilities of tuna. A representative of the National Fisheries Institute would be present on each voyage to ensure that the Japanese shared results of exploratory studies with the Cuban Government.

If the studies proved the commercial feasibility of tuna fishing, the Japanese would then have to nationalize the tuna fleet in accordance with Cuban law and employ Cuban citizens as captains and crew members. The Japanese catch thereafter would not be allowed to compete with the Cuban fishing industry, but would have to be exported. The only exception to the required export of the Japanese catch would be if domestic consumers petitioned the National Fisheries Institute

for retention of items needed for local consumption. The tuna to be explored for consists of yellowfin and bluefin tuna.

The declared advantage to Cuba of permitting the Japanese to enter into tuna fishing (and other incidental fishing during the tuna off-season) activities would be: (1) provide a healthy type of competition to Cuban fishermen; (2) educate Cuban fishermen into the profitable possibilities of tuna fishing; (3) train Cuban crews in advanced Japanese methods of fishing

for tuna and other species; (4) a 20-percent fee would be charged against the Japanese catch payable to the National Fisheries Institute, ostensibly as a "contribution" but actually for fishing rights; (5) the Japanese would construct a freezing plant (possibly at Cienfuegos) of large capacity, which would be used for export purposes, but could also be employed by the Cubans during the tuna off-season (tuna is caught during April to October in Cuba).



Ecuador

NEW DECREE REDUCES LICENSE AND REGISTRATION FEES AND PERMITS BAIT FISHING: Opening of Guayaquil Bay off Ecuador to bait fishing and reduction of license tariffs of United States boats catching tuna in waters off Ecuador were announced in June 1957 by the director of the Department of Fish and Game of Ecuador during a visit to California.

A brief notice in an Ecuadorian newspaper announced the revocation of the \$4.00 increase in fishing licenses (decreed on June 10, 1954, by Emergency-Decree Law No. 29). On May 25 a long article in El Comercio gave the full text of the new law. The new law, Emergency-Decree Law No. 11, signed May 8, 1957, is supposed to favor the growth of Ecuadorian fisheries, and increase the income of the government, which has suffered in the past two years from the decrease in the number of foreign fishing boats taking out Ecuadorian licenses.

The new law revokes the US\$4.00 increase and the license fee reverts to the amounts prescribed in Article 28, Clause (b) of the Fishing and Maritime Law. These fees are, per registered net ton of foreign fishing boats; swordfish US\$20, tuna US\$12, shark US\$12, cod US\$8, cod fillets US\$24.

The fees for registration of foreign fishing boats remain the same as prescribed by the Fishing and Maritime Law: swordfish, tuna, and shark US\$200, and cod US\$100.

Another provision of the law outlines the use to be made of the funds collected from the fisheries industry by taxes and fees. Sixty percent of such funds are to go to the Ministry of Economy for the development of the fishing industry through such means as making studies, the completion of the "Manta project," the installation of refrigerated warehouses at fishing centers, the development of the construction of fishing boats, the establishment of warehouses and buildings, the employment of technicians, both Ecuadorian and foreign, etc. In addition, the Ministry of Economy is authorized to establish a "Fishing Enterprise" or to participate in such an enterprise as an associate. It may so associate with either firms or individuals, nationals or foreigners.

Another decree, pending a few minor details, will open the Gulf of Guayaquil to the bait fishery.



El Salvador

FISHERIES TRENDS, JUNE 1957: The Fishery Section of the Ministry of Economy of El Salvador is currently making a census of the marine fishermen, boats, and gear. Results so far obtained indicate that there are more fishermen and the catch is greater than previously estimated, a June 14, 1957, note from the U. S. Fishery Attache in Mexico states.

The "Cooperativa de Pescaderes del Tamarindo," a fishery cooperative formerly operated by the Ministry of Labor, has ceased to operate. The two trawlers owned by the cooperative are reported to be up for sale.

The Leonardo I, a combination trawler and freezership formerly of Mexican registry, is now under Salvadoran registry. It is reported that the vessel will trawl and freeze fish and shrimp. Some of the shrimp probably will be exported.



German Federal Republic

CANNED MACKEREL MARKET: Mackerel is not a popular type of fish in West Germany. Production and consumption of mackerel are negligible factors in the West German markets. Most of the very small domestic pack of canned mackerel is exported due to the lack of a domestic outlet.

Table 1 - Approximate Calculation of Retail Price in West Germany for One 15-oz. Can of Mackerel ex-United States West Coast 1/

	DM.	U. S. Cents
Price f. o. b. dock Los Angeles	0.42	10.0
c. i. f. cost about 25 percent	0.10	2.4
c. i. f. price West German North Sea port	0.52	12.4
Import duty 25 percent	0.13	3.1
	0.65	15.5
Compensatory turnover tax, 6 percent	0.04	1.0
	0.69	16.5
Inland freight cost	0.04	1.0
	0.73	17.5
Profit margin for importers, 10 percent	0.07	1.6
	0.80	19.1
Profit margin for wholesale dealer, 10 percent	0.08	1.9
	0.88	21.0
Profit margin for retail dealer, 25 percent	0.22	5.3
Retail price	1.10	26.3

1/ BASED ON INFORMATION RECEIVED FROM THE FACHVERBAND DER FISCHKONSERVEN-IMPORTEURE E.V. (CANNED FISH IMPORTERS ASSOCIATION), HAMBURG.

Although skeptical, importers are at present inclined to give thought to the importation of canned mackerel because of a temporary scarcity of herring and imported sardines and the resultant increase of prices for these products. Small sample shipments of canned mackerel have reportedly been ordered from Portugal and Japan. It appears that United States cannery would stand a fair chance to obtain part of this business. United States exporters will have to meet price limits, which are fairly low, because of keen competition from cheap domestic products.

Although the importation of canned mackerel has not been liberalized, it appears that government quotas can be obtained without too much difficulty under the German designation of "makrele."

Most of the mackerel landed in German ports from April through September is caught during the herring season. It is estimated that in 1956 about 6,000 metric tons of mackerel (*Scomber scombrus*) was landed in West German ports. The trips during the herring season last too long (10-14 days) to bring mackerel to port in a sufficiently fresh condition to permit canning of the entire catch. About 25 percent is sold to the fish-meal factories.

About 2,000-3,000 tons of mackerel are canned. West German production of canned mackerel for export is less than 50,000 cases, packed natural. All of this

production is exported, mainly to Italy, Greece, Egypt, and France. It is estimated that not more than 5,000 cases of canned mackerel (48 $7\frac{1}{2}$ -oz. flat oval cans) are being sold in the domestic market at about 18-19 U. S. cents a can.

An unknown quantity of mackerel is exported fresh to Holland, Italy, and France. Small quantities are smoked and some are sold fresh in the domestic market. Less than 15 percent of the total West German catch of mackerel reaches the domestic market, either canned, smoked, or fresh.

Consumers of canned fish in West Germany are described as "herring-eaters." Herring, which under normal conditions is in abundant supply, is prepared and preserved in a wide variety of sauces and packs. About 90 percent of this production sells in 200-gram (about $7\frac{1}{2}$ -oz.) cans; approximately 70 percent is in tomato sauce. Usually herring is offered at attractively low prices which compare very favorably with other types of protein food. The canned mackerel, which to date has been marketed by a few canners, is more of a specialty item consisting of fillets of mackerel packed in oil in $7\frac{1}{2}$ -oz. oval cans, selling at about DM 0.75-DM 0.80 a can (18-19 U. S. cents). The bulk of this product is being sold in some limited geographical regions in the southern part of West Germany. Total annual sales amount to about 5,000 cases of 48 cans ($7\frac{1}{2}$ -oz.) each. During the past few years the market for this product has been fairly steady.

No official statistics are available on the imports of canned mackerel into West Germany, but trade sources believe that until the end of 1956 they were practically non-existent, considering the fact that more than 90 percent of the relatively small domestic production has to be sold abroad.

In 1956 there developed a severe scarcity of herring in West Germany. Catches of this type of fish were about 25 percent below those of the preceding year with a resultant marked price increase for canned herring. Prices of imported processed fish, mostly canned sardines, have followed suit, due to reduced catches of this product in the countries of origin. In order to offset the scarcity in herring supply and to counteract price increases, importers have recently contracted for small quantities of canned mackerel from Portugal (fillets in oil) and Japan (in tomato sauce). Both countries will supply oval cans of $7\frac{1}{2}$ ounces, net weight. Japanese mackerel in tomato sauce is quoted at about DM 0.52 (12 U. S. cents) a can, and DM 0.58 (14 U. S. cents) a can for mackerel packed in oil, c.i.f. West German North Sea port. These products would have to retail at about DM 0.85-DM 0.90 (20-21 U. S. cents) a can.

The possibility of establishing quotas for the import of canned mackerel from the United States has been considered, and officials have stated that they did not foresee any serious obstacles if such quotas should be in the magnitude of "several hundreds of thousands of dollars." If this trade should develop into millions of dollars, its merits would have to be reconsidered. This attitude may be explained by the desire on the part of the government to counteract the rise of prices for fish products by encouraging imports of cheap canned fish on a short-term basis. In the long run, however, the government apparently wishes to protect its domestic fish-canning industry.

Importers would prefer to buy $7\frac{1}{2}$ -ounce flat oval cans containing fillets of mackerel packed in oil or pieces of boneless and skinless mackerel packed in tomato sauce. Such a product should retail at not more than DM 0.75-DM 0.80 (18-19 U. S. cents) a can in West Germany. If they could find a market at all in this country, the tall 15-ounce cans of boneless and skinless pieces of mackerel in tomato sauce should retail (see table 1) at about DM 1.00-DM 1.10 (24-26 U. S. cents) a can (United States Consul in Bremen, dispatch dated February 28, 1957.)

NOTE: VALUES CONVERTED AT RATE OF DM 1 EQUALS 23.9 U. S. CENTS.



Greece

CANNED MACKEREL AND JACK MACKEREL MARKET: Greece has no domestic production of canned mackerel or jack mackerel. Only salted mackerel is produced locally, points out a March 14 dispatch from the United States Embassy at Athens.

The domestic fish canning industry is represented by three plants, chiefly producing canned bonito, described as "Greek salmon." These plants also produce very small quantities of canned sardines, tuna, octopus, lobster, and shrimp.

Production of canned fish amounted to 400 metric tons in 1956 as compared with 185 tons in 1955. Canned bonito is by far the most important canned fish produced in Greece. Because of its low price, it sells well in the local market. The more popular sizes are the 225-gram (8-oz.) and 450-gram (16-oz.) cans, which sell for 6 (20 U.S. cents) and 11 paper drachmas (36 U.S. cents). Small exports of canned bonito are made, and in 1956 about \$75,000 worth was exported by the two largest firms. Fresh bonito is mostly imported from Turkey.

The other fish canned locally are obtained from Greek waters. Greek fish production totaled 57,572 tons (48,521 sea, 9,051 fresh-water) in 1955 as compared with 51,392 tons (44,131 sea, 7,261 fresh-water) in 1954.

Table 1 - Greek Imports of Canned Fish (Excluding Oysters and the Like)

Product	Jan.-Nov. 1956			12 Months 1955		
	Quantity	Value 1/		Quantity	Value 1/	
	1,000 Lbs.	1,000 Drachmas	US\$ 1,000	1,000 Lbs.	1,000 Drachmas	US\$ 1,000
<u>Tariff paragraph 4-d:</u>						
Lobsters	8.8	176.8	5.9	-	-	-
Crawfish	-	-	-	-	-	-
Tuna	40.8	308.3	10.3	9.0	60.2	2.0
Salmon	145.2	1,399.1	46.6	129.7	955.8	31.8
Shrimp	43.4	618.7	20.6	17.9	222.9	7.4
Not elsewhere spec. .	2,749.1	10,715.8	356.8	1,936.8	8,897.2	296.3
Total	2,987.3	13,218.7	440.2	2,093.4	10,136.1	337.5
<u>Tariff paragraph 4-e:</u>						
Sardines	2,335.6	14,413.3	480.0	2,060.7	12,145.3	404.4
Not elsewhere spec. .	573.4	4,401.6	146.5	237.4	1,225.2	40.8
Total	2,909.0	18,814.9	626.5	2,298.1	13,370.5	445.2
Grand total	5,896.3	32,033.6	1,066.7	4,391.5	23,506.6	782.7

1/ C.I.F. GREEK PORT.

Because Greece is surrounded by the sea, the Greek people generally prefer fresh fish to canned fish. However, consumption of canned fish has been on the increase. A total of 5.9 million pounds of canned fish (valued at US\$1.1 million) was imported during the first 11 months of 1956 as compared with 4.4 million pounds (valued at US\$782,700) the entire year of 1955. Greek preference is for canned sardines followed by squid and salmon.

There is no indication regarding consumption of canned mackerel in Greece, since there is no domestic production, and Greek import statistics do not show this item separately. According to information obtained from local provision merchants, canned mackerel is being currently consumed, though in very small quantities, on Crete island, and in the rural areas.

The most popular size of mackerel used in Greece is the 15-oz. tall can either in natural style or in tomato sauce, in about the same proportion. The retail price of the 15 oz. -tall can, natural style, ranges from 7.00-7.50 paper drachmas (23-25 U. S. cents).

Following the liberation of Greek imports in 1953, canned fish may be freely imported into Greece. Competition in the local fish market between foreign suppliers is stiff, and the deciding factor is price.

Table 2 - Greek Imports of Canned Fish Under Tariff Paragraph 4-e (Sardines and Similar Fish) from United States

Product	Jan.-Nov. 1956			12 Months 1955		
	Quantity	Value		Quantity	Value	
	1,000 Lbs.	1,000 Drachmas	US\$	1,000 Lbs.	1,000 Drachmas	US\$
Sardines	88.4	366.2	12.2	268.8	1,366.4	45.5
Other n.e.s. under 4-e	21.9	60.8	2.0	-	-	-
Total	110.3	427.0	14.2	268.8	1,366.4	45.5

United States exporters would have an opportunity of selling more canned mackerel to Greece if they could quote competitive prices. The local agent of a U. S. exporter reported that the mid-February 1957 U. S. quotation for mackerel delivered c.i.f. Piraeus was US\$6.20 a case of 48-tall 15-oz. cans net, compared to US\$5.80 for German mackerel.

Canned mackerel are dutiable under Greek Tariff paragraph 4-d which covers: "Lobsters, crawfish, tuna, shrimp, salmon, and other fish not elsewhere specified, all prepared and preserved in cans, without deduction of tare for immediate containers." The duty rates are: "Most-Favored-Nation" (MFN) countries, 30 metallic drachmas per 100 kilograms (4.9 U. S. cents a pound); GATT countries, 22.5 metallic drachmas per 100 kilograms (3.7 U. S. cents a pound). In the case of this tariff paragraph, 1 metallic drachma is equal to 10.80 paper drachmas. The present exchange rate for paper drachmas is about 30 for US\$1. In addition to the import duty, surtaxes amounting to 75 percent of the import duty are assessed on importation.

On this basis, the import duty and surtax on canned mackerel per pound is 8.6 U. S. cents for MFN countries and 6.4 U. S. cents for GATT countries. A turnover (sales) tare of 1.875 percent of the wholesale price of these goods, calculated on the basis of the c.i.f. price increased by 15 percent, is also levied on the importation of canned fish. Also, lobsters, shrimp, crawfish, and crabs, are subject to a 40 percent luxury tax, additionally.

The duty rates for tariff paragraph 4-e canned "sardines and similar fish" are: MFN countries, 30 metallic drachmas per 100 kilograms (4.9 U. S. cents a pound); GATT countries, 18 metallic drachmas per 100 kilograms (2.9 U. S. cents a pound). The rates of the metallic drachma, the paper drachma, and the turnover tax for T.P. 4-e are the same as for tariff paragraph 4-d given above.

Under present Greek regulations, importers of canned fish (tariff paragraphs 4-d and 4-e) are required to pay their foreign suppliers either by Letter of Credit, or cash against shipping documents presented in Greece. No credit terms are permitted. In the case of payment against shipping documents, the Greek importer is required to deposit 50 percent of the value of his order at a recognized local bank. This deposit is offset at the time of payment of the order. At the request of the importer, the deposit may be transferred to the foreign supplier as an advance remittance.

Portuguese and Japanese suppliers insist on full payment by Letter of Credit, because of the export regulations of their respective countries.



Iceland

FISHERIES TRENDS, JANUARY-MAY 1957: The major January-May Icelandic fishing season was a disappointment and ended a week or two earlier than usual. The catch will be under that of last year, which was exceptional. The Government has been forced in many instances to make payments to seamen under the minimum wage guarantee provisions of their contracts. The trawlers have suffered most of all due to catches 20 percent under last year, reports a May 14 United States consular dispatch from Reykjavik.

The possibility arises that Iceland will find it difficult to fill all its marketing contracts unless the summer and fall fishing give unusually good results. The amount of fish salted and dried is from 35-45 percent under last year to permit frozen-fillet processing to continue at more than last year's rate. In these circumstances the frozen fillet trade (80 percent with the Soviet Bloc, 20 percent with the United States) can continue at last year's levels. Trade in stockfish (principally with Africa through the United Kingdom, Holland, and Germany) and salted fish (Italy, Portugal, Brazil, Israel, etc.) must inevitably be reduced.

A new feature this year has been the conversion of some of the south coast motorboat fleet to drift-net herring fishing during the spring season because of the disappointing groundfish fishery results. The herring is present in quantity on the south coast in the spring as well as the fall since it spawns twice a year; usually it is ignored at this time of year in favor of the more lucrative cod fisheries.

Motorboat operators are now looking forward to the north coast herring season which begins late in June, taking courage from the failure of the Norwegian catch to hope that the herring may return to Iceland again this year in force.



Japan

ALBACORE EX-VESEL PRICE DROPS WITH GOOD FISHING EARLY IN JUNE: The Japanese Nakaminato fish harbor was active with big albacore landings of 600 tons between June 1-4. Five boats came in on June 1 with 152 metric tons, 4 boats on the 2nd brought 100 tons, on the 3rd 7 boats landed 200 tons, and on the 4th 4 boats brought in 140 tons. On the 3rd one 144-ton vessel landed 40 tons, the best fare so far this year. Prices ex-vessel were about \$121 a ton on the 1st and closed at \$107 on the 4th, for a total landed value of \$100,000. Small fish went for local consumption and the large ones went to local and Tokyo area freezing and canning plants, the June 7 issue of *Nippon Suisan Shimbum* states.

On June 5 a 30-ton vessel and 8 other boats came in to Shimizu Harbor with about 520 tons of albacore, but canners and freezers showed little inclination to buy, and good fish over 25 pounds in weight went for a high of \$168 a ton, while small fish under 16 pounds went as low as \$94, with an average of \$127. These were the lowest prices of the year and 60 percent under last year at the same time. Six boats unloaded only 400 tons and held back the rest unsold. "If the price continues to drop like this, it will bring about a situation like that seen in 1952, with albacore cheaper than sardine and the price below \$70. If the price would just settle at around \$168, we could keep out of the red, but . . ." points out the

June 10 issue of the same periodical. On the other hand, the skipjack market, which looked poor earlier, was reported holding up well and many boats were planning to switch over to skipjack fishing.

The June 5 issue of the same periodical stated that with slack buying of frozen albacore by United States buyers, the ex-vessel price for albacore has dropped, and the fishermen consider that the exporters have made an agreement among themselves to refrain from buying. At the same time the Fair Trade Committee is investigating whether there is in fact such an agreement among the Japanese operators.

Since the export price is bound by a check price of US\$270, the industry cannot respond to low bids from United States buyers. Although the exporters have considered lowering the check price, the idea has been shelved for the present. Therefore, in order to cut down their holdings and be able to hold out, they are refraining from buying.

According to the Frozen Tuna Exporters' Association, "We have not made any such agreement." They thus deny the fishermen's contention of an agreement among exporters, but in any case the frozen tuna industry is under heavy pressure from both within and without the country.

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EARLY SHIPMENTS OF CANNED SALMON PLANNED: The Japan Canned Salmon Sales Company reports it is negotiating with several United States firms for export of 115,000 cases of canned salmon, the New York *Journal of Commerce* of June 27 pointed out.

The United States firms hoped to buy 100,000 cases of canned pink salmon, 5,000 cases of canned red salmon, and 10,000 cases of canned chum salmon, for early shipments by the end of July, to cater to the United States summer markets, since the supply of domestic canned salmon until August was expected to be light.

The Japanese company is reported as making every effort to finalize the negotiations with the United States firms for the exports.

The company announced that the export prices would be close to those of last year, which were f.o.b. Japanese ports, pink salmon \$18 a case of 96 8-ounce cans, and \$16.75 a case of 48 16-ounce cans; and red salmon \$32 a case of 48 16-ounce cans.

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EXPORTS OF FISHERY PRODUCTS, APRIL 1957: During April 1957 Japan's exports of fish and fish preparations were valued at US\$10.9 million, down 16.4 per cent from the March total of US\$13.0 million (U. S. Embassy in Tokyo, dispatch dated May 14, 1957).

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NORTH PACIFIC SALMON MOTHERSHIP FISHERY CATCH GOOD: The salmon catch by the Japanese mothership fishing fleets operating in the Aleutians have exceeded expectations, according to the Japanese Fisheries Agency. Based on the successful mothership-type operations in this area, it is anticipated that Japan should be able to reach the 120,000-metric-ton quota (agreed to between Japan and Soviet Russia on the catch to be made in the Aleutians and the Okhotsk Sea) before the season officially closed on August 10. Japan currently has 14 motherships and 405 catcher boats operating in the Aleutian area and two motherships with 56 catcher boats operating in the Okhotsk Sea.

The fishing fleet operating in the Aleutians had caught 22.3 percent of the quota of 87,000 metric tons as of May 31, 1957, as compared with 18.9 percent of a smaller quota of 77,000 metric tons on the same date in 1956.

Japanese Salmon Catch by Mothership Fleets in the Aleutians, as of May 31, 1957 Compared with a Year Earlier		
Species	As of May 31, 1957	As of May 31, 1956
 (In Metric Tons)	
Red	10,852	4,120
Chum	8,135	10,148
Pink	400	260
Silver	0	6
King	6	4
Total	19,393	14,538

It was expected that the mothership-type operations in this area would meet the above quota by July 31, or ten days before the end of the season. The two fishing fleets operating in the Okhotsk Sea

only recently begun operations and there are no data as yet on the catch from that area or the catch being made by Japanese shore-based boats. Japanese Fisheries Agency officials take an optimistic view and believe that the Okhotsk Sea mothership-type operation quota of 13,000 metric tons and the shore-based catcher boat quota of 20,000 metric tons will be met before the season closes (U.S. Embassy in Tokyo, dispatch dated June 21).

The salmon catch by species by mothership-type operations in the Aleutians as of May 31, 1957, was significantly higher than on the same date in 1956.

The successful catch in the Aleutians so far is attributed to the favorable weather conditions coupled with abundant salmon runs. The industry reports that the

main fishing grounds have shifted further north this year. This shift is thought to be due to the influence of warm currents in the south which have driven the salmon to colder northern waters. As can be noted from the above table, Japan's catch of the commercially-valuable red salmon, as of May 31, 1957, was 2.6 times the amount caught by the same date in 1956, and the industry is anticipating that this year should be considerably more profitable than last year. This optimism is also supported by lower operating costs resulting from a reduction in the number of catchers, the shorter fishing season, and the relatively firm market prices which have prevailed in Japan for all types of fish.

Of particular significance in the progress of catch by the Japanese fishing fleet operating in the Aleutians is the large catch of red salmon. The Soviet Union representatives, in their negotiations for a quota early this year, showed particular concern over the conservation of red salmon stocks. The relatively favorable catch of red salmon by the Japanese tends to disprove the Soviet contention that conservation measures are necessary if this variety of salmon is not to be depleted. On the other hand, some observers feel that if Japan's catch of red salmon for the season should be significantly higher than for last year, as appears likely, it may become a point of issue in the coming negotiations to establish the 1958 quota.



Mexico

FISHERY RESEARCH INSTITUTE PROPOSED BY FISHING INDUSTRY: The Mexican National Chamber of the Fishery Industry has proposed that the Government establish a fishery institute for research and development purposes. According to an article published in the June 10, 1957 issue of *El Mercado De Valores*, the weekly journal of the Nacional Financiera, the institute would be autonomous with headquarters in Mexico City. It would be a consultative and advisory body to the Ministry of Marine in matters pertaining to the scientific investigation of the fisheries. It would be at the service of the nation and the fishery industry.

The institute would be in charge of a director who would operate under the direction of two councils. The administrative council would be comprised of one representative from each of the following organizations: Ministry of Marine, Ministry of Economy, Ministry of Treasury and Public Credit, Ministry of Public Education, Ministry of National Property and Administrative Inspection, National University of Mexico, Bank of Mexico, Nacional Financiera, and National Cooperative Confederation, and two representatives from the National Chamber of the Fishery Industry. The representative from the Ministry of Marine would serve as president.

The executive council would consist of five specialists in fisheries, fish culture, biology, hydrology, and economics. One of these specialists would be named as director of the institute, a June 14, 1957, dispatch from the U. S. Regional Fishery Attache in Mexico states.

The operating program proposed for the institute includes:

1. Fishery explorations on the high seas. (a) Equip and operate adequate boats in order to carry out this objective. (b) Undertake explorations and investigations to locate and determine the commercial feasibility of new fishing areas and the extension of known ones. (c) Conduct the necessary investigations on shrimp and other species to determine their migrations. (d) Promote the use of and experiment with better fishing methods and gear.

2. Scientific investigation of the national fishery resources. (a) Establish hydrobiological statistics in the fishery ports and other places where necessary

or advisable. (b) Establish laboratories in the same fishery centers properly equipped to undertake any type of investigation necessary to comply with the objectives. (c) Undertake studies and programs in fish culture. (d) Operate laboratory and investigational boats wherever required. (e) Organize and maintain the necessary statistics for its own investigations as well as those of the government and the fishery industry.

3. Promote economic and technical studies to develop the fisheries and related industries. (a) Coordinate the studies and conclusions of the investigations carried out by the institute for the purpose of increasing the catch and industrialization of the products of the sea and their derivatives. (b) Publish the information obtained for the use of the government and the industry. (c) Create and maintain a library.

4. Prepare and develop the training of technical personnel for the industry. (a) Assist in the preparation of experts in fishing, biology, hydrology, and related sciences through and with the help of the National University of Mexico, the National Polytechnical Institute, and other national and foreign institutions. (b) Prepare fishermen, engineers, and fishing captains in the schools established or that may be established in the future by the Ministry of Marine or the Ministry of Public Education.

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IMPORT AND EXPORT DUTIES ON FISHERY ITEMS REVISED: The Diario Oficial, an official Mexican publication, of May 29, 1957, published a notice of changes in the import and export duties on the following fisheries items:

1. Established an official price of 42.60 pesos a gross kilo (about US\$1.55 a pound) for determining import ad valorem duties on "Floats of whatever materials for fish nets." Previously no official price existed. The same publication on April 25, 1957, and effective April 26, 1957, established a duty of 0.05 pesos a kilo (about 18 U. S. cents a 100 pounds) plus 5 percent ad valorem on floats for fish nets.

2. Also Mexico lowered the official export price from 1.5 pesos a gross kilo (5.4 U. S. cents a pound) to 1.2 pesos a gross kilo (4.4 U. S. cents a pound) on "Livers and liver waste of shark and other classes of fishes."

The changes were effective on May 30, 1957 (U. S. Fishery Attache to the U.S. Embassy in Mexico).

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NEW FISH-PROCESSING PLANT: The Ministry of Marine (Diario Oficial, June 11, 1957) granted permission to a Mexican firm to establish a plant for processing fishery products at Punta Arena in Magdalena Bay, Lower California. The minimum investment must be 200,000 pesos (US\$16,000) of which 120,000 pesos (US\$9,600) must be spent on the plant and machinery, states a June 13 dispatch from the U. S. Fishery Attache in Mexico.

It is understood that this is to be a small operation that will can some fish and abalone but specialize mostly on freezing spiny lobsters.

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PACIFIC COAST SHRIMP PRICE DISPUTE SETTLED: The dispute over shrimp prices between the cooperative shrimp fishermen and the boat owners of the Pacific coast of Mexico was settled on May 22--one week after the season opened on May 16.

An increase in the price paid to the fishermen's cooperatives by the vessel owners of 370 pesos (about US\$29.62) a metric ton for headless shrimp was granted--about $1\frac{1}{3}$ cents a pound.

The new contract will be in effect for two years or until May 15, 1958. However, it is subject to revision in May 1958 if in the meantime the cost of living, or the daily minimum wage, increases along the Mexican Pacific coast.

The new contract price to be paid the cooperatives (National Cooperative Confederation) is 2,280 pesos (US\$182.54) a metric ton of headless shrimp. This is 500 pesos (US\$40.00) more a metric ton than the previous price, but 130 pesos (US\$10.40) a ton will be discounted from the amounts the boat owners now pay the captain and first engineer. The crew will be allowed 45 pesos (US\$3.60) a ton for loading and unloading the boats, but if the crew does not perform these services the boat owner will be credited with the 45 pesos. The 45-peso loading and unloading charge is included in the 370-peso (US\$29.62) increase.

The boat owners, during long runs between fishing grounds, have also agreed to pay a "navigation wage" of 21.66 pesos daily (US\$1.75) to those members of the crew not on a salary.

The normal complement of a Mexican Pacific coast shrimp-trawler is 7 men which includes a captain, engineer, assistant engineer, a cook, and 3 fishermen. It is customary for the boat owner, in addition to paying the contract price to the cooperative, to pay the captain and engineer a daily wage throughout the entire year of between 25-40 pesos each (US\$2.00 and \$3.20). In addition to these amounts the captain and engineer are paid a bonus for each ton of shrimp caught. The amount of the bonus varies with different boat owners but is reported to average 375 pesos (US\$30.00) a ton for the captain and first engineer. The captain and engineer are each paid an additional 30 pesos (US\$2.40) per ton when the trip catch is more than two tons.

It is also customary for the boat owner to pay a bonus to the assistant engineer and to the cook. The amount of the bonus varies with the boat owner, but averages 70 pesos a ton (US\$5.60) each for the cook and the assistant engineer.

On the basis of the new contract each crew member will receive 65 pesos (US\$5.20) more a ton of shrimp. This increase will be effective for only five members of the crew since the increases for the captain and engineer will be deducted from the bonuses paid them by the boat owners. For a fisherman the increase amounts to about 45.5 percent. The average fisherman will earn about 8,000 pesos a year (about US\$640.00).

The crew will now share 1,455 pesos (about US\$116.40) a metric ton of shrimp caught. If the crew does the loading and unloading of the boat they will share an additional 45 pesos (US\$3.60) a ton. The remaining 780 pesos (US\$62.45) a ton will be paid to the Cooperative for dues, social security, severance tax, and other minor charges.



Morocco

TRADE EXCHANGES WITH EAST GERMANY INCLUDE FISHERY PRODUCTS EXPORTS: A notice issued by the Moroccan Ministry of Economic Affairs and published in *Bulletin Officiel No. 2327* of May 31, 1957, provides additional lists of import and export quotas for trade exchanges between Morocco and East Germany. This agreement was signed in Berlin on April 12, 1957, and provides that the quotas

involved should be used before December 31, 1957. Included among the Moroccan export possibilities are the following quotas: canned sardines US\$65,000 and fish meal US\$40,000.

The most recent agreement was within the framework of the Franco-East German commercial arrangement concluded on July 12, 1956, and published in Bulletin Officiel No. 2306 of January 4, 1957, covering the period from July 1, 1956, to December 31, 1957. That agreement provided for \$100,000 of fish meal and \$150,000 of canned sardines.



Norway

COD FISHERIES TRENDS AS OF MAY 11, 1957: Norwegian total landings of spawning cod and Finmark young cod as of May 11, 1957, amounted to 84,659 metric tons of which 40,842 tons have been sold for drying, 33,752 tons have been cured, and 10,065 tons have been sold as fresh fish. In addition, 3,210 tons (34,848 hectoliters) of cod oil have been produced. Last year during the same period the cod fisheries yielded 131,442 metric tons. The decline in the cod landings this year as compared with last year was primarily due to a poor catch of winter or spawning cod. The catch of Finmark young cod has been about the same (26,672 tons as compared with 25,333 tons) as that made in the similar period of 1956. (Fiskets Gang, May 16, 1957.)



Pakistan

FISHING INDUSTRY TO BE DEVELOPED FROM U. S. GRANT: It has been reported by the Pakistan press that the Ministry of Agriculture is preparing plans to use a US\$10-million grant from the United States International Cooperation Administration (ICA) to develop the fishing industry of Pakistan.

ICA commodity aid in fiscal year 1956 provided US\$500,000 for nylon twine for nets and US\$500,000 for marine Diesel engines. During fiscal year 1957, ICA grants provided US\$105,000 for nylon twine and US\$485,000 for marine Diesel engines. (U. S. Embassy dispatch dated June 7, 1957.)



Republic of the Philippines

IMPORT DUTIES ON CANNED FISH LOWERED: The Philippine government announced, effective July 1, 1957, a revised tariff which makes certain changes in their import duties for canned fish. Of principal interest to the United States interests are the new rates of duty on canned mackerel, salmon, sardines, anchovies, and tuna which will be 15 percent ad valorem, according to preliminary reports from the Philippines. Under the United States-Philippine trade agreement, United States articles are subject to 25 percent of the regular duties until January 1, 1959. Accordingly, imports of the products listed above will be dutiable upon import into the Philippines until January 1, 1959, at 3.75 percent ad valorem. Prior to July 1, the effective rate was 4.875 percent ad valorem.

The new duty on canned squid and cuttlefish is 20 percent ad valorem, so on that basis these United States products would be dutiable at 5 percent ad valorem.

The 17 percent special import surtax was not affected by the new tariff. This surtax applies to all canned fishery products (except canned sardines) and is in addition to the regular ad valorem duty.

On or after January 1, 1959, United States articles are scheduled to be dutiable at 50 percent of the regular duties for the ensuing three-year period.



Republic of Korea

NEW FISH CANNERIES TO BE BUILT BY UNKRA: Two new fish canneries, each with an annual production capacity of 100,000 cases, will be built in the Republic of Korea by the United Nations Korean Reconstruction Agency (UNKRA), according to a United Nations press release dated July 5, 1957.

The fish canneries, one to be situated at Pohang on the east coast and the other at Narodo on an island off the south coast of Korea, will be built and equipped by UNKRA at a dollar cost of US\$324,500. The prefabricated building sections, two sets of cannery machinery, a small fish meal plant, and machinery for two ice plants have already arrived.

It is estimated that the canneries will be ready to go into operation in November 1957. Their main products will be canned mackerel, crab, and shrimp.

This is part of an UNKRA program of aid for the fisheries industry under which fish markets have been repaired, ice plants equipped, essential supplies for fishermen imported, and new fishing boats and trawlers built.



Spain

BILBAO DISTRICT FISHERIES TRENDS, MAY 1957: Anchovy catches in the Spanish Bilbao district (Bay of Biscay) were a little irregular up to the end of May, since the fish arrived in northern waters unusually early during the first days of March and appeared in volume during the last 10 days of May, at which time the fishing craft were being readied for the tuna and sardine season. Constituting one of the basic products of the Bilbao fish canning industry, anchovies were priced wholesale at 5.50 pesetas a kilo (about 6 U. S. cents a pound).

Fishing trawlers operating on the high seas report satisfactory results for the month of May. Although catches were a little under the monthly average, higher prices compensated for the smaller hauls.

While sardine catches have been light from June to September during the past few years in the Cantabrian waters, they have been plentiful the year round in the Mediterranean region, which presently supplies Bilbao on a daily basis with several truckloads of fish for immediate consumption and canning purposes. As a result, local fishermen are seriously considering the possibility of operating in the Mediterranean waters in the coming winter months (U. S. Consul in Bilbao, dispatch dated June 10, 1957).

NOTE: VALUES CONVERTED AT RATE OF 42 PESETAS EQUAL US\$1.

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VIGO FISHERIES TRENDS, APRIL 1957: Fishing: During April, landings at Vigo sold over the fish exchange amounted to about 9.3 million pounds, valued at US\$775,781. The April catches represent a decrease in quantity of about 12.7 percent as compared with the previous month and were about 28.3 percent over the April 1956 landings. Some of the vessels fishing out of southern Spanish ports since January returned to Vigo for the summer and fall fisheries. The sardine season opened on April 15, but the catch to the end of the month amounted to only 50,000 pounds.

The principal varieties of fish landed in April 1957 were: pomfret or dollar-fish (Brama raii) 2.5 million pounds, small hake 1.4 million pounds, and horse mackerel (Trachurus trachurus) about 1.2 million pounds.

A closed season for mollusks was established on April 1, effective through September 30. In the Vigo consular district the species affected are: clam (Tapes decussatus), cockle (Cardium edule), razor clam (Solem marginatus), scallop (Pecten maximus), small scallop or zamburnia (Clamys opercularis).

Fish Canning: The fish canneries in the Vigo area purchased about 704,000 pounds of fish during April as compared with about one million pounds in March and 427,000 pounds during April 1956.

The canneries were gravely concerned over the shortage of tin plate. The small quantities available are sufficient for limited operations only.

Exports of canned fishery products continued at a low level during April. The new rate of exchange (42 pesetas to US\$1) on their exports of canned fishery products is expected to improve the competitive position of the Vigo fish canneries in world markets. An additional premium of 3.0 pesetas (7.1 U. S. cents) is expected to be allowed on certain exports of canned fish (probably anchovies).

Domestic markets had been dull up to the end of April. The Government declared canned fishery products free of price control in an announcement dated April 9, 1957. (May 9 dispatch from United States Consul at Vigo.)

NOTE: VALUES CONVERTED TO US\$ EQUIVALENT AT RATE OF 1 PESETA EQUALS US\$0.0238.



United Kingdom

NEW TYPE HERRING TRAWLERS FROM POLAND: A newly-formed Great Yarmouth firm in Britain is to have two trawlers of a new type built in Gdynia, Poland, for its herring fleet. One will be paid for partly with herring cured at Great Yarmouth and exported to Poland. The British Herring Industry Board is buying the second trawler with a Ministry of Agriculture and Fisheries grant, and will charter it to the Great Yarmouth firm. A total of 28 similar vessels are being built in Gdynia for the Polish fleet and the Soviet Union.

The new-type herring trawler is equipped to dress, salt, and pack the herring in barrels on board, states an April 12, 1957, dispatch from the United States Embassy in London.

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SARDINE CANNERS LOWER PRICES TO MEET IMPORT COMPETITION: There was a record pack of Cornish sardines (pilchards) in 1956. A total of 2,700 metric tons were canned out of some 6,000 tons landed. But British cannery have found marketing more difficult than ever before because imports from the Union of South Africa and from South-West Africa have also been the heaviest since exports from those areas commenced in 1948.

One canner, however, has decided to double output next season and has already reduced prices for the current pack. Some cannery are said to be bitter at alleged price cutting of South African firms, most of whom have offered a four percent discount on last year's minimum export prices. They have also complained of the practice of certain British agents who tie-in canned salmon with South African pilchards in order to effect quantity sales.

British pilchard canning has developed almost side by side with the industry in South Africa. Forgetting prewar days, the British market was largely supplied by the United States in the 1946-49 period and imports of 16,000 tons in 1947 were the highest since the war. The following year imports were negligible and, apart from some purchases from Japan in 1949 and 1950, the market has been wholly supplied by Cornwall and South Africa. In 1952, total supplies were over 8,000 tons, of which 33 percent were Cornish and the balance were from South Africa.

In 1953, exports from the Union declined and the Cornish cannery supplied 45 percent of the 5,000-ton total.

The South African pack declined in 1954 and so did output in Cornwall, but imports from South-West Africa showed a substantial increase to well over half the total of 5,200 tons. The following year, despite a good pack, Cornish cannery supplied only 10 percent of the British market and 8,700 tons of the 10,700-ton total came from South Africa. Over-all supplies last year were 14,800 tons, nearly up to the 1947 figure of more than 16,000 tons; the Cornish pack was a record at 2,700 tons and South-West Africa shipped 11,000 tons, but Union exports were just under 1,000 tons.

The Cornish pilchard industry comprises 6 or 7 firms. Two firms with their own sales force can sell their pilchards without much difficulty, and they report increased demand. The remaining cannery market through agents in the same way that South African cannery in Britain.

The biggest packer sells 1-lb. talls in tomato at 16s. 10d. (US\$2.35) a dozen cans as against the new season's South African price which is about 13s. (US\$1.82) a dozen ex-wharf. This packer has always paid higher prices for fish but this year they will pay 3s. 9d. a stone (3.7 U. S. cents a pound) or 4s. (4 U. S. cents a pound) for fish packed straight from the nets into metal containers. The other cannery are paying 2s. 6d. a stone (2.5 U. S. cents a pound), but one or two have been refusing fish owing to poor quality normal at this time of the year.

Labor costs in Cornwall are also believed to be much higher--girls receive about 2s. 6d. (35 U. S. cents) an hour in the cannerys.

Other British firms are quoting 15s. (US\$2.10) a dozen cases delivered to wholesalers for 250-case lots of 1-lb. ovals and this is about the same as the ex-store price for new season South African ovals, without quantity discounts.

Salmon has been in very short supply since the war and shows a considerable profit margin. A buyer who takes up a combined offer makes his profit on the salmon and offers his pilchards for re-sale at below cost. This, and the discounts, have been the chief factors for the carry-over stocks of Cornish pilchards. (The South African Shipping News and Fishing Industry Review, April 1957.)

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WHITE FISH EXPORTS TO RUSSIA PROPOSED TO OFFSET CRAB MEAT IMPORTS: Russia has been asked to balance a definite part of her exports of canned crab meat to Britain with imports of white fish from that country. The Government hoped that this would result in a substantial amount of white fish from Britain entering

Russia. The Parliamentary Secretary of the Board of Trade announced this in the House of Commons.

He said that white fish exports to Russia would thus be supported in the same way as herring exports in the past.

There is a potential market for white fish in Russia, Poland, Czechoslovakia, and East Germany, but these are being supplied mainly by the Scandinavian countries, Iceland, and to a lesser extent Holland.

Russia is supplying Britain with about £1 million (US\$2.8 million) worth of canned salmon and crab annually, and the barter agreement under which it was sent provided that herring should be supplied against it. In 1955, the herring exports to Russia fell short of the £1 million by £676,000 (US\$1.9 million) and in 1953 by £462,000 (US\$1.3 million).

"In 1957 Iceland will export to Russia large quantities of herring, but in addition she will send 32,000 metric tons of cod fillets, valued at about £4 million (US\$11.2 million). We could have a good slice of this trade if we had that active support we believe we should have from the Government," a member of Parliament said.

As to East Germany, Norway will supply white fish worth about £2.3 million (US\$6.3 million) this year, while Iceland will supply East Germany with about £1 million (US\$2.8 million) worth of white fish.

Britain supplied £120,000 (US\$336,000) worth of frozen white fish fillets to Czechoslovakia in 1955. In 1957 while the Government had gone ahead with the proposal to export herring there, white fish had been left out altogether. The Czechs are importing 7,000 tons of white fish valued at about £900,000 (US\$2.5 million) from Iceland, states the British fishery periodical, The Fishing News, of May 17, 1957.

A member of Parliament said: "We should be tough with the Russians and insist that a part of the herring shortfall be taken in white fish.

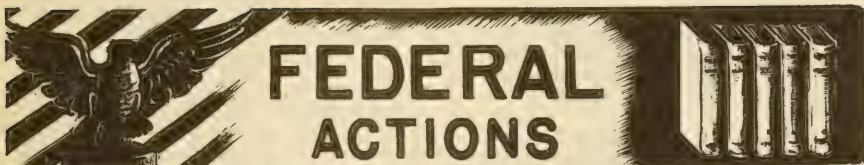
"If that were done, we could develop our deep-freezing industry, which would mean more employment. We have had reports from Hull that the unemployment figures are creeping up again.

"We need extra filleters, extra men on the dock and in the ice factories, and men for developing ice factories and deep-freeze facilities. That would benefit the Northeast and East coast and would help the export trade."

The Board of Trade is willing to continue arrangements for the issue of licenses for the import of certain less essential East German goods against the export to them of white fish of equivalent value, as already made by the herring industry. At the moment they had not been successful in securing a quota for exports of white fish to Czechoslovakia.

Under current trade arrangements Hungary has established a quota for imports of cured, frozen, or salted fish to a value of £20,000 (US\$56,000) and Bulgaria a quota for herring and white fish, value £50,000 (US\$140,000).





Department of the Interior

FUR-SEAL CONVENTION RATIFICATION URGED:

Affirmative action on the interim Convention for the Conservation of North Pacific Fur Seals was urged on July 16 upon the United States Senate by the Secretary of the Interior.

The Convention, now before the Senate Committee on Foreign Relations, sets forth the fundamental principles which will be followed in the management of the North Pacific fur-seal herd. The Convention was signed by representatives of Japan, Canada, Soviet Russia, and the United States on February 9, 1957, after discussions which began November 28, 1955.

In a letter to the Senate Committee on Foreign Relations Secretary Seaton declared: "We consider this Convention an important step in the continued preservation of one of our great natural resources." He expressed the hope that the Senate would ratify the Convention this session since a resolution passed at the negotiating conference "stipulated that the Governments would again consult on this matter if ratifications were not deposited by January 1, 1958."

Secretary Seaton stated that two Nations, Canada and Japan, have already ratified the Convention and that Russia reportedly is waiting action by the United States.

Besides stating that seal harvesting shall be done by the United States on the Pribilof Islands and by Russia on the Asiatic Islands, the Convention provides:

1. The establishment of a North Pacific Fur Seal Commission of four members, one from each signatory nation.

2. A six-year cooperative research program.

3. The prohibition of pelagic sealing, except to the extent specified for research purposes.

4. Boarding and search of vessels at sea in suspicious circumstances and arrest of vessels and crews upon reasonable belief of seal hunting, with trial in the country of the flag of the vessel.

5. The enactment and enforcement by the signatories and the application of such measures as may be necessary to guarantee the observance of the Convention.

6. A sharing of the land kill, with Canada and Japan each receiving annually 15 percent of the seal skins taken by the United States and by Russia.



Interstate Commerce Commission

EXPRESS RATE INCREASE ON FISH AND SHELLFISH IN EASTERN TERRITORY DENIED:

On August 21, 1956, the Railway Express Agency petitioned the Interstate Commerce Commission for a 15-percent increase in less-than-carload (l.c.l.) charges on shipments moving within Eastern Territory except on l.c.l. charges for shipments of milk and cream, newspapers, and human remains. Eastern Territory is that general area lying north of the Potomac and Ohio Rivers and east of the Mississippi River and a line drawn through Peoria and Chicago, Ill.

This request was reviewed under the Commission's docket No. 32035. Late

in 1956 an emergency increase of 4 percent in l. c. l. charges was authorized, including such charges on shipments of fish and shellfish within Eastern Territory. This authorization was promptly placed into effect by the Railway Express Agency.

On May 31, 1957, the Interstate Commerce Commission authorized a further 11-percent increase in Eastern Territory l. c. l. charges, but after hearings (in which members of the industry and U. S. Fish and Wildlife Service personnel testified) it specifically exempted fish and shellfish from this increase. It indicated that the higher rates proposed on those commodities might force eastern producers to abandon markets in which they presently compete with southern producers. It is estimated that the eastern producers and distributors of fish and shellfish products by this decision will save about \$250,000 annually, which amount, otherwise, would have increased their costs of transportation.



Department of State

U. S. FISHERY ITEMS UNAFFECTED BY SUPPLEMENTARY TRADE AGREEMENT WITH UNITED KINGDOM AND THE BENELUX COUNTRIES:

The United States Government announced on June 27 that it had completed the compensatory tariff negotiations with the United Kingdom and Benelux countries (Belgium, Netherlands, and Luxembourg) held in connection with the proposed increase in the United States rate of duty on certain linen toweling. The formal announcement of the intention to enter into the limited trade negotiations with these countries was made on March 18, 1957. Included among the items listed for consideration of possible reduction in United States import duty at the negotiations were sodium alginate, spermaceti wax, and sperm oil, refined or otherwise processed.

None of these fishery items were on the list of items on which the United States granted tariff concessions in these compensatory agreements. Therefore, no change will be made in their current rates of duty.



Treasury Department

INTERNAL REVENUE SERVICE

RULES THAT "COMPANY FISHERMEN" ARE EMPLOYEES:

The Internal Revenue Service has ruled that "company fishermen," who are furnished boats and gear by the organization to which they supply fish, are employees for purposes of the Federal unemployment tax; and "independent fishermen" are not.

The ruling (Revenue Ruling 57-168) involved an agreement between a packer and a fishermen's union. Under the agreement the "company fishermen" must be acceptable to the employer. The company furnishes the fishing vessel, all the necessary marine and fishing gear and maintenance, fuel and supplies, mess-hall services ashore, and licenses.

Under these conditions and certain others described in the Revenue Ruling, the Internal Revenue Service found that the "company fishermen" are employees within the meaning of section 3121 (d) of the Federal Insurance Contributions Act (FICA).

With respect to the "independent fishermen," the ruling states that fishermen who furnish their own boats and gear, pay their own operating expenses, and deliver fish to the cannery of their choice, are not employees for purposes of the FICA.



White House

UNITED STATES COMMISSIONER APPOINTED TO NORTH PACIFIC FISHERIES COMMISSION:

The White House on June 13 announced the appointment of Ross L. Leffler, Assistant Secretary for Fish and Wildlife, Department of the Interior, as Commissioner of the United States section of the International North Pacific Fisheries Commission, vice John L. Farley who recently resigned this post.



Eighty-Fifth Congress (First Session)

Public bills and resolutions which directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings, and other chamber actions by the House and the Senate, as well as signature into law or other final disposition, are covered.



ALASKA TIDAL WATERS: S. 2536 (Barrett), introduced in the Senate on July 12, a bill to grant the Territory of Alaska title to certain lands beneath tidal waters, and for other purposes; to the Committee on Interior and Insular Affairs. The term "natural resources" includes oil, gas, and all other minerals, but does not include fish, shrimp, oysters, clams, crabs, lobsters, sponges, kelp, and other marine animal and plant life, or water power, or the use of water for the production of power.

BOAT REGULATION: H. R. 8474 (Bonner), introduced in the House on July 1, a bill to promote boating safety on the navigable waters of the United States; to provide coordination and cooperation with the states in the interest of uniformity of boating laws, and for other purposes; to the Committee on Merchant Marine and Fisheries. This bill could set up a system of registration for undocumented boats or vessels, propelled in any way.

CHEMICAL ADDITIVES IN FOOD: H. R. 8629 (Wolverton), introduced in the House on July 10, a bill to protect the public health by amending the Food, Drug, and Cosmetic Act to prohibit the use in food of additives which have not been adequately tested to establish their safety; to the Committee on Interstate and Foreign Commerce similar in language to H. R. 8112 (Miller, Nebraska) and in purpose to six or more bills previously introduced, but different in wording.

H. Res. 311 (Farbstein), introduced in the House on July 11, a resolution that a select committee be appointed to conduct a full and complete investigation and study of the use of chemicals and other additives in food, medicine, and beverages with a view to ascertaining what deleterious effects such chemicals have on human life and health; to the Committee on Rules. (See *Commercial Fisheries Review*, February 1957, p. 63, May 1957, p. 71, June 1957, p. 69, and July 1957, p. 45.)

COMMERCIAL PRODUCTION OF FISH AND RICE LANDS: Research for Commercial Production of Fish on Flooded Rice Acreage (Hearing before a Subcommittee on Interstate and Foreign Commerce, United States Senate, Eighty-Fifth Congress, First Session, on S. 1552, a bill to authorize the Secretary of Agriculture to establish a program for the purpose of carrying on certain research and experimentation to develop methods for the commercial production of fish on flooded rice acreage in rotation with rice field crops,

and for other purposes), July 8, 1957, 47 pp., illus., printed. Contains statements submitted during the hearings by the public and Government agencies, reports from the General Accounting Office, and Interior and Justice Departments, and illustrations of game and food fish generally raised at Federal hatcheries. (See *Commercial Fisheries Review*, April 1957, p. 65.)

NORTH PACIFIC FISHERIES ACT: S. 2212 (Magnuson), a bill to amend the North Pacific Act of 1954. Passed by the House on July 15 in lieu of H. R. 7974 (Tollefson) and cleared for the signature of the President. This bill was signed by the President on July 24 (P.L. 85-114). This bill provides that the North Pacific Fisheries Act of 1954 (68 Stat. 698) is amended as follows:

In section 12 strike out the words "contiguous to the territorial waters of Alaska" and substitute therefor the words "north of the parallel of north latitude of 48 degrees and 30 minutes: And provided further, that no such regulation shall apply in the convention area south of the 49 parallel of north latitude with respect to sockeye salmon (*Oncorhynchus nerka*) or pink salmon (*Oncorhynchus gorbuscha*)." (See *Commercial Fisheries Review*, June 1957, p. 69 and July 1957, p. 46.)

House Report No. 704, Amending the North Pacific Fisheries Act of 1954, to accompany H. R. 7974, 7 pp., printed, July 8, 1957, 85th Congress, 1st Session. Presents favorable reports by the Acting Secretary of State, the Assistant Secretary of the Interior for Fish and Wildlife, and a draft of the bill. Also discusses the purpose of the bill.

PACIFIC MARINE FISHERIES COMMISSION: The Chairman of the Pacific Marine Fisheries Commission submitted the Ninth Annual Report of the Pacific Marine Fisheries Commission for the year 1956 (pursuant to Public Law 232, 80th Congress) on July 1, to the Committee on Merchant Marine and Fisheries and Senate Committee on Interstate and Foreign Commerce.

SMALL BUSINESS ACT AMENDMENT: S. 2504 (Clark), introduced in the Senate on July 9, a bill to amend and extend the Small Business Act of 1953, as amended, was placed on the calendar. This new bill replaces other Senate bills on this subject and H. R. 7963 (Spence) which was passed by the House on June 25. S. 2504 was reported on July 9 by the Senate Committee on Banking and Currency (S. Rept. No. 597). This bill extends the authority of the Small Business Administration one year and increases the authorization for business loans by \$75 million. The House Bill (H. R. 7963) would make the Small Business Administration a permanent agency. (See *Commercial Fisheries Review*, February 1957, pp. 66-67, April 1957, p. 65, May 1957, p. 72, June 1957, p. 69-70, and July 1957, p. 47.)

House Report No. 555, Small Business Act, to accompany H. R. 7963, 46 pp., printed, June 13, 1957, 85th Congress, 1st Session. Summarizes in some detail results of the deliberations of the House Committee on Banking and Currency and includes a comparison of the existing law (1953) and the provisions of the law as it would be amended by H. R. 7963. Discusses the purpose of the bill.

SOCKEY SALMON FISHERY ACT: S. 1806 (Magnuson and Jackson), a bill to amend the Sockeye

Salmon Act of 1947. Signed by the President on July 11, 1957 (Public Law No. 85-102). The public law follows:

To amend the Sockeye Salmon Fishery Act of 1947.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 2 (a) of the Sockeye Salmon Fishery Act of 1947 (61 Stat. 511) is amended to read as follows:

"(a) Convention: The word 'convention' means the convention between the United States of America and the Dominion of Canada for the protection, preservation, and extension of the sockeye salmon fisheries of the Fraser River system, signed at Washington on the 26th day of May 1930, as amended by the protocol to the convention, signed at Ottawa on the 28th day of December 1956."

Sec. 2, Section 2 (e) of such Act is amended to read as follows: "(e) Sockeye salmon and pink salmon: The term 'sockeye salmon' means that species of salmon known by the scientific name *Oncorhynchus nerka*, and the term 'pink salmon' means that species of salmon known by the scientific name *Oncorhynchus gorbuscha*."

Sec. 3. Such Act is further amended by striking out "sockeye salmon" wherever used in such Act, except in subsections (a) and (e) of section 2, and inserting in lieu thereof "sockeye salmon or pink salmon";

Sec. 4. Section 7 (a) of such Act is amended by striking out "fishery" and inserting in lieu thereof "fisheries";

Sec. 5. The amendments made by this Act shall take effect on the date of entry into force of the protocol, signed at Ottawa on December 28, 1956, between the United States of America and Canada to the convention, for the protection, preservation and extension of the sockeye salmon fisheries of the Fraser River system, signed at Washington on May 26, 1930.

House Report No. 557, Amending the Sockeye Salmon Fishery Act of 1947, to accompany H. R. 6587, 5 pp., printed, June 13, 1957, 85th Congress, 1st Session. Summarizes changes in existing law (61 Stat. 511) and presents reports by the Assistant Secretary of State and the Assistant Secretary of the Interior for Fish and Wildlife.



"MARICULTURE" IF WORLD POPULATION OUTRUNS FOOD SUPPLY?

There is reason for genuine concern that the earth's human population may outrun the food supply at some seemingly inevitable future date--unless something is done to change the picture.

One possible solution lies in the more effective use of the foods already being produced by the world's green plants--the ultimate source of all food. It has been estimated that some 500 billion tons of solid plant matter are made each year by green plants through photosynthesis. Man uses only a minute fraction of this amount. Only one-tenth of this photosynthesized food is produced by hand plants. Ninety percent of the world's food is made by marine and fresh-water algae, mostly marine.

If we are alarmed that the productivity of the land will not keep pace with the demands of our growing population, perhaps we should look to the resources of the sea for more of our food--that almost untouched 90 percent of the earth's photosynthesized material.

Many marine scientists are taking this look.

They see that on land nearly all food production is based on agriculture, in which the materials furnished by nature are controlled, improved, and cultivated by scientific methods. On the other hand, they see that the meager amount of food we take from the sea today is hunted from the wilderness of the oceans. As one scientist said compared with agriculture, our marine fisheries "are still in the stone age."

So a new concept has recently appeared, "mariculture," the utilization of the food resources of the sea using the techniques worked out and employed so successfully in modern scientific agriculture.

Some marine laboratories are beginning to take on the look of young agricultural experiment stations now. Animal breeders, accustomed to working with cattle and poultry, are investigating the chances of creating better strains of fish, shellfish, and shrimp. The Rockefeller Foundation is sponsoring such a preliminary study on marine animal breeding. Biochemists are starting work on nutritional requirements of marine animals for possible use in cultivation.

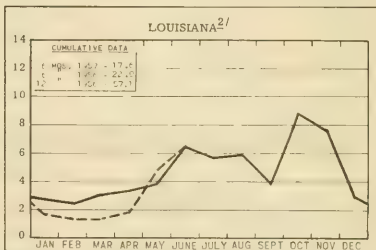
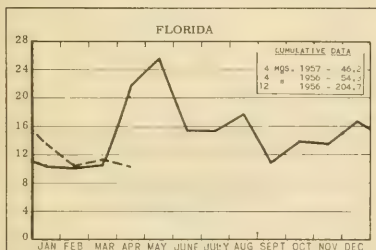
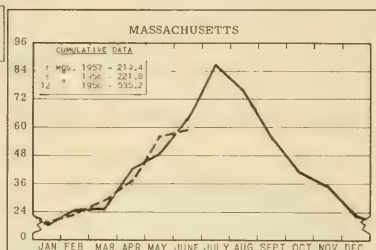
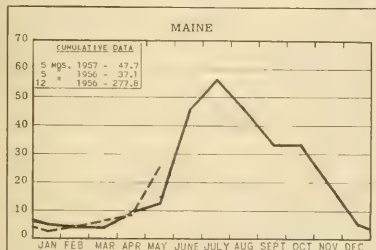
The field is a pioneer one. Keep your eyes on mariculture.

--Horace Loftin,
Science News Letter, June 8, 1957

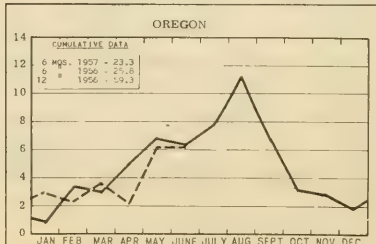
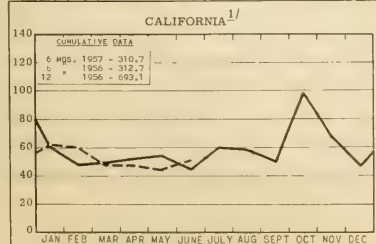
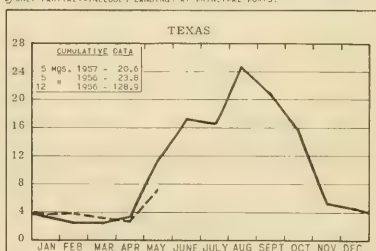
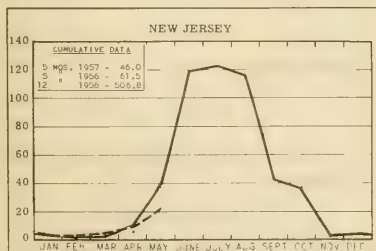
FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds



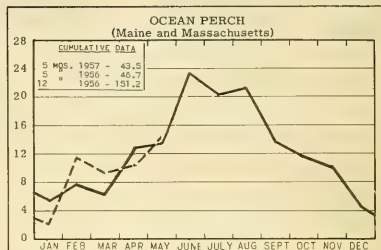
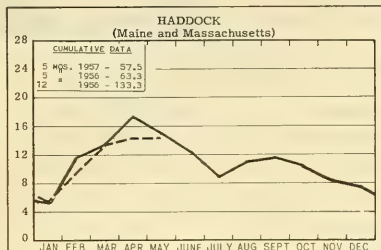
^{2/}ONLY PARTIAL--INCLUDES LANDINGS AT PRINCIPAL PORTS.



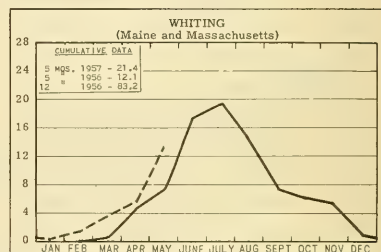
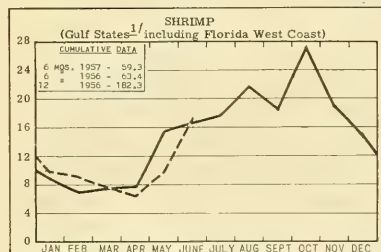
^{1/}ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

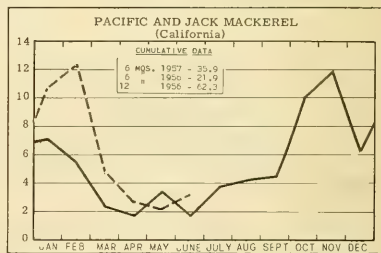
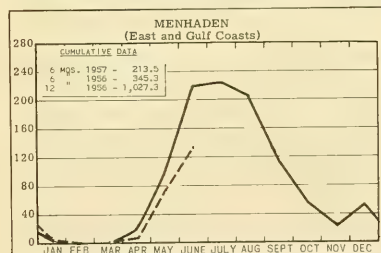


In Millions of Pounds

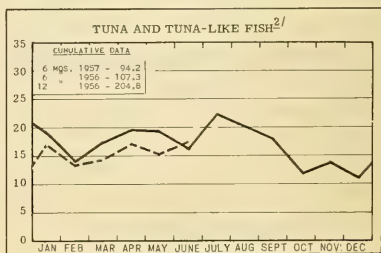
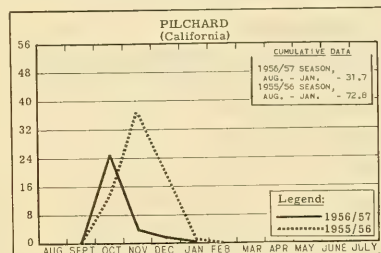


^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



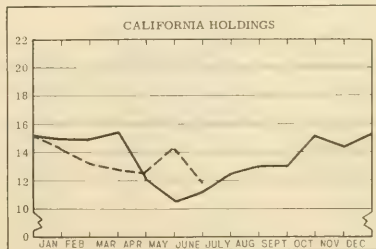
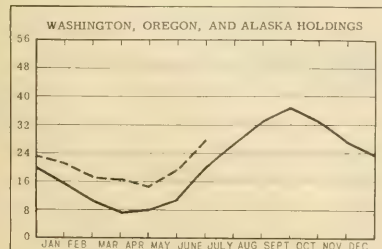
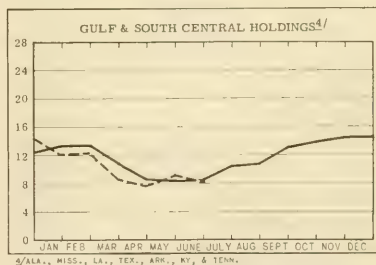
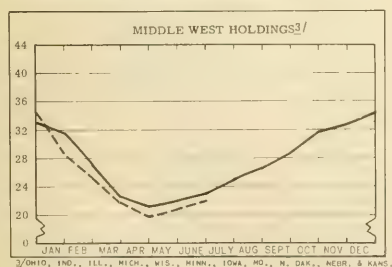
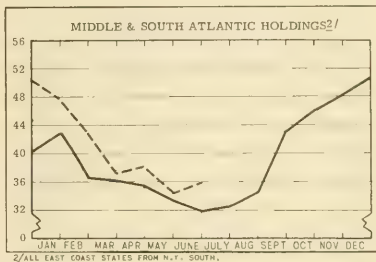
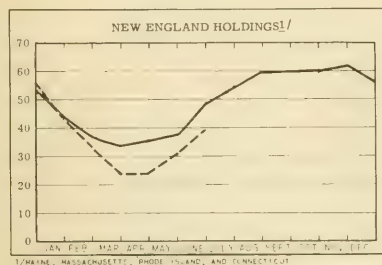
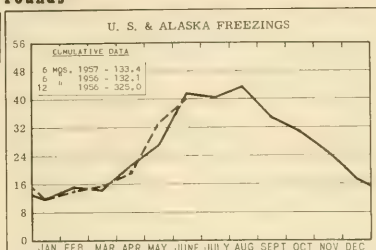
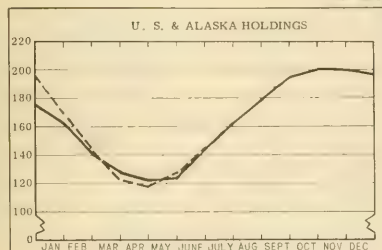
In Thousands of Tons



^{2/}RECEIPTS BY CALIFORNIA CANNERIES, INCLUDING IMPORTS.

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

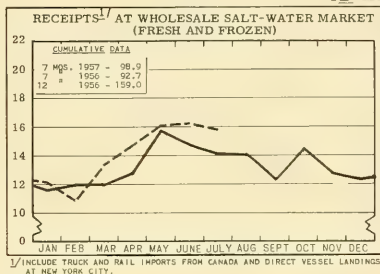
In Millions of Pounds



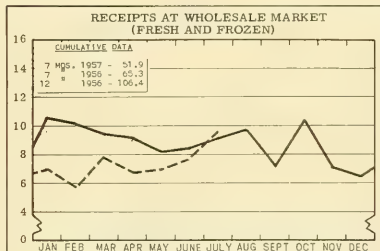
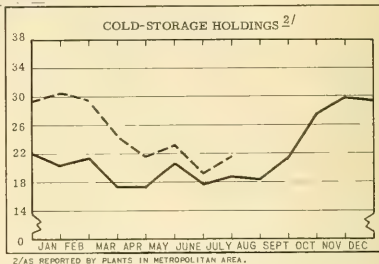
*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

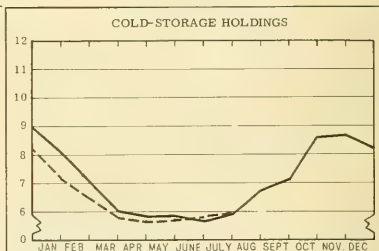
In Millions of Pounds



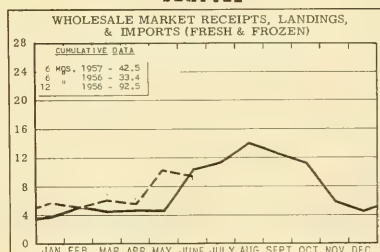
NEW YORK CITY



CHICAGO



SEATTLE



BOSTON

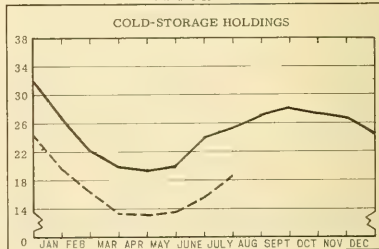


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

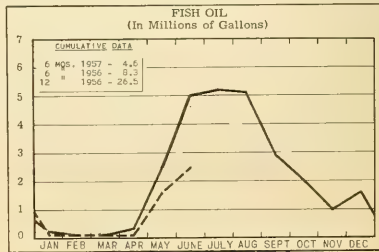
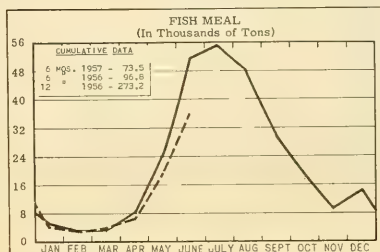
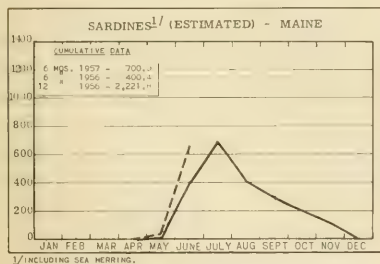
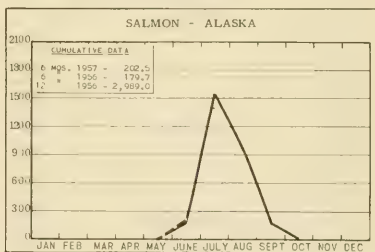
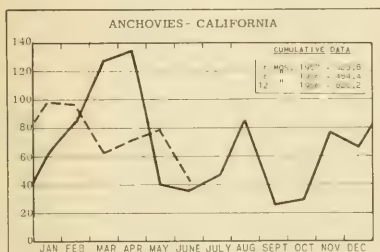
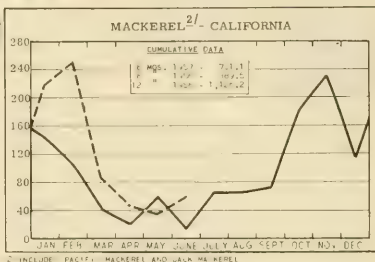
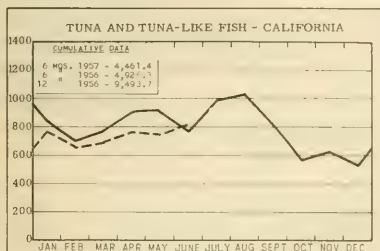


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	$\frac{1}{4}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP	48	--	5 oz.
TUNA	48	No. $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	$\frac{1}{2}$ lb.	8 oz.

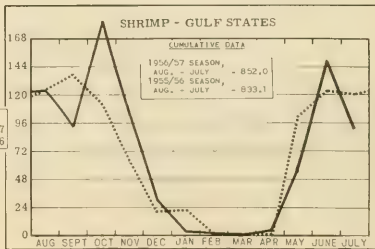
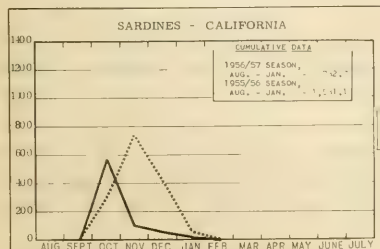
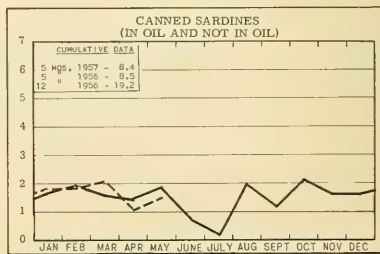
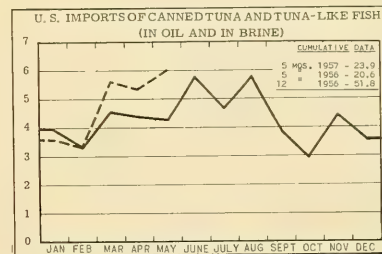
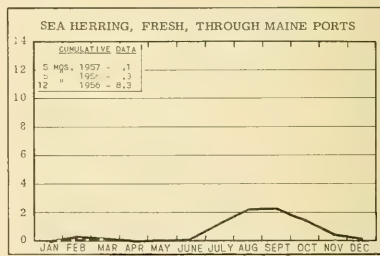
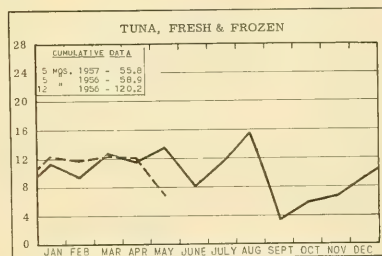
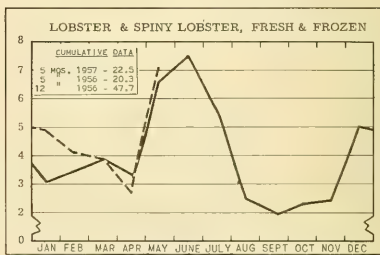
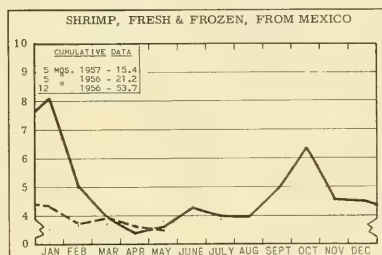
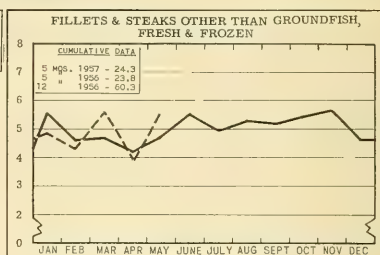
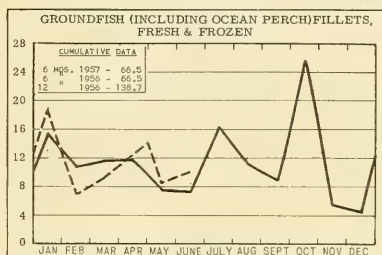
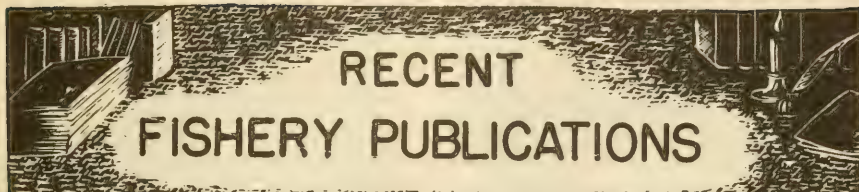


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
- SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
- SSR - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
- SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- Number Title
- CFS-1512 - Fish Meal and Oil, February 1957, 2 pp.
 - CFS-1537 - Fish Meal and Oil, March 1957, 2 pp.
 - CFS-1550 - Fish Meal and Oil, Annual Summary, 1956, 4 pp.
 - CFS-1560 - Rhode Island Landings, March 1957, 3 pp.
 - CFS-1561 - Mississippi Landings, March 1957, 2 pp.
 - CFS-1563 - Fish Meal and Oil, April 1957, 2 pp.
 - CFS-1564 - Frozen Fish Report, May 1957, 2 pp.
 - CFS-1565 - North Carolina Landings, April 1957, 2 pp.
 - CFS-1566 - Alabama Landings, March 1957, 2 pp.
 - CFS-1569 - New Jersey Landings, April 1957, 4 pp.
 - CFS-1570 - Shrimp Landings, February 1957, 4 pp.
 - CFS-1571 - New York Landings, April 1957, 4 pp.
 - CFS-1572 - Texas Landings, April 1957, 3 pp.
 - CFS-1573 - Maine Landings, April 1957, 3 pp.
 - CFS-1574 - Alabama Landings, Annual Summary, 1956, 3 pp.
 - CFS-1575 - Shrimp Landings, March 1957, 4 pp.
 - CFS-1578 - Mississippi Landings, April 1957, 2 pp.
 - CFS-1579 - Chesapeake Fisheries, Annual Summary, 1955, 6 pp.
 - CFS-1580 - Pacific Coast States Fisheries, Annual Summary, 1955, 6 pp.
 - SL-13 - Wholesale Dealers in Fishery Products, North Carolina, 1957 (revised).

Firms Canning, 1956 (Revised):

- SL-102 - Maine Sardines (including sea herring).
- SL-102A - Pacific Sardines.
- SL-104 - Mackerel.
- SL-105 - Alewives and Alewife Roe.
- SL-110 - Oysters.
- SL-112 - Shrimp.
- SL-120 - Anchovies.

Firms Manufacturing, 1956 (Revised):

- SL-152 - Oyster Shell Products.
- SL-155 - Marine Pearl Shell Buttons.

Firms Manufacturing, 1956 (Revised) (Contd.):

- SL-159 - Fresh-Water Mussel-Shell Products.

SSR-Fish. No. 198 - Physical Oceanographic, Biological, and Chemical Data--South Atlantic Coast of the United States, Theodore N. Gill Cruise 2, by William W. Anderson, Jack W. Gehringer, and Edward Cohen, 270 pp., illus., December 1956.

SSR-Fish. No. 211 - Effects of Unialgal and Bacteria-Free Cultures of *Gymnodinium brevis* on Fish and Notes on Related Studies with Bacteria, by S. M. Ray and William B. Wilson, 50 pp., illus. Presents indirect evidence that strongly supports the contention that *Gymnodinium brevis*, commonly named "red tide," is the cause of fish kills when its concentration reaches the order of hundreds of thousands to millions of organisms per liter. This evidence includes (1) the presence of dead or dying fish in water containing great numbers of *Gymnodinium brevis*, (2) laboratory demonstrations that water containing great numbers of *Gymnodinium brevis* is toxic to fish, and (3) demonstration that substances toxic to fish may be extracted from water infested with *Gymnodinium brevis*.

SSR-Fish. No. 213 - History of the Great Fishery of Newfoundland, by Robert de Loture, translated from the French by Clyde C. Taylor, 147 pp., illus., April 1957. A complete history of the social, economic, and legal development of the fishery of Newfoundland.

Sep. No. 481 - How to Cook Frozen Fish Without Prethawing: Part II - The Effect of Oven Temperature on Cooking Time for Frozen Halibut Steaks.

Sep. No. 482 - Research in Service Laboratories (July 1957): Contains these articles--"Frozen Fishery Products Storage Life Extended by Glucose-Salt Brine Glaze;" "Nuclear Radiations for Preservation of Fish Quality Standards;" and "Technical Note No. 39 - Frozen Tuna Sampler."

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Boston Fishery Products Monthly Summary, May 1957, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Landings and ex-vessel prices by species for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; and Boston frozen fishery products prices to wholesalers; for the month indicated.

California Fishery Products Monthly Summary, March 1957, April 1957, and May 1957 issues, 10 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of raw tuna and tunalike fish, herring, mackerel, anchovies, and squid; pack of canned tuna, herring, mackerel, anchovies, and squid; market fish receipts at San Pedro, Santa Monica, San Diego, and Eureka areas; California imports; canned fish and frozen fish prices; for the months indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, April 1957, May 1957, and June 1957 issues, 12 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the months indicated.

(Seattle) Monthly Summary - Fishery Products, April 1957, 4 pp.; May 1957, 5 pp.; and June 1957, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, 421 Bell St. Terminal, Seattle 1, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Oregon) wholesale dealers; also Northwest Pacific halibut landings; for the months indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALASKA:

(Fisheries Experimental Commission) Biennial Report, 1955-1957, 11 pp., printed. Fisheries Experimental Commission, Ketchikan, Alaska, 1957.

BEACH SEINING:

Ceylon's Beach Seine Fishery, by P. Canagaratnam and J. C. Medcof, Bulletin No. 4, 32 pp., illus., printed. Fisheries Research Station, Department of Fisheries, Galle Face, Colombo, Ceylon, December 1956. A report on the preliminary phases of a study of beach seining, Ceylon's most important single method of fishing. Illustrates the structure and describes operations of the beach seine, including reports on the following: changes, variations, and disposal of the catch; names and sizes of fish taken at various places in Ceylon; yield per unit of effort; and regulatory, financial, and other problems of the beach seine fishery.

BYPRODUCTS:

"Squalene Content of Various Shark Livers," by J. H. Heller, M. S. Heller, S. Springer, and E. Clark, letter to the editors, *Nature*, vol. 179, no. 4566, May 4, 1957, pp. 919-920, printed. Macmillan & Co., Ltd., St. Martin's Street, London, W. C. 2, England.

CEYLON:

General Features and Productivity of the Wadge Bank Trawl Fishery, by S. Sivalingham and J. C. Medcof, Bulletin No. 6, 23 pp., illus., printed. Fisheries Research Station, Department of Fisheries, Galle Face, Colombo, Ceylon, 1957. Summarizes the records covering the entire history (1928-1935 and 1945 to the present) of the commercial trawl fishery carried on off the Wadge Bank--a 3,000-square-mile trawlable area on the South Indian continental shelf. The following subjects, supplemented by tables and figures, are discussed: physical features; trawler operations; general features of the catch, including details of composition and total landings and value; variations in catch-per-unit effort--year to year, seasonal, day to night, and irregular variations; and relative productivity of Wadge Bank--comparisons with other tropical areas and with temperate zone areas which show that Wadge Bank is one of the best trawling areas in the tropics.

Progress Reports, Biological and Technological, No. 2, 56 pp., illus., printed. Fisheries Research Station, Department of Fisheries, Galle Face, Colombo, Ceylon, July 1956. Contains the following biological reports: "Study of the Biology of the Sea Bream, *Lethrinus nebulosus*," "Wadge Bank Trawl Fishery, 1955," and "A Survey of the Balapitiya Lagoon Prawn Fishery," by S. Sivalingham; and "Observations on Some Sargassum Seaweeds of Ceylon," by M. Durairatnam. The technological reports contained are: "Exploratory Bottom Long-Lining along the North-East Coast of Ceylon during the South-West Monsoons of 1954 and 1955" and "Exploratory Bottom Trawling along the North-East Coast of Ceylon during the South-West Monsoon of 1955," by Yves Jean; "Mechanization of the Oru," by A. W. Lantz; "Mechanization of Fishing Craft," by E. R. A. de Zylva and E. R. Kvaran; "Preservation of Fish in Chilled Brine Tanks during Transport--Exploratory Vessels," by A. W. Lantz; "Preservation of Fish by Salting and Drying," by C. Gunasekera, N. de Silva, and A. W. Lantz; "Physical Analysis of Trawler Fish," L. D. Gunasekera and A. W. Lantz; "An Investigation into the use of Salvinia for the Preservation of Fish during Storage and Transport," by N. de Silva and A. W. Lantz; and "Methods of Collection, Cost of Production and Bleaching of *Gracilaria lichenoides*," by M. Durairatnam.

CHESAPEAKE BAY STATES:

The Seafood Industry of the Chesapeake Bay States of Maryland and Virginia (A Study in Private Management and Public Policy), by Charles L. Quittmeyer, 315 pp., illus., processed. Advisory Council on the Virginia Economy, Division of Planning and Economic Development, Richmond, Va., March 1957. The introductory chapter has attempted to point out that the fishing industry of Maryland and Virginia has enough significance to warrant study, that there are some complex problems bearing on profitable marketing that face anyone concerned with developmental policy for this industry, and that there are certain conditions against which such policy might well be weighed before being undertaken as a guide to specific direction. The following chapters deal with the specifics of the factors of supply and distribution that determine, and are determined

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by, profitable marketing, with a final chapter on broad developmental suggestions. A very useful feature is the detailed bibliography. There is also a 50-page abstract prepared from this report for the Committee on Fisheries which contains a discussion of the fishing industry of the Chesapeake Bay region; an analysis of production; and chapters on the market for Chesapeake Bay seafood, channels of distribution, costs and prices, sales promotion, and developmental opportunities.

COMPOSITION:

"The Component Acids of Some Indian Fresh-Water Fish Fats," by S. P. Pathak and V. N. Ojha, article, *The Biochemical Journal*, vol. 66, no. 2, 1957, pp. 193-195, printed, Cambridge University Press, Bentley House, 200 Euston Road, London, N.W.1, England.

CRABS:

Oxygen Requirement and Mortality of the Blue Crab in the Chesapeake Bay, by James H. Carpenter and David G. Cargo, Technical Report XIII, 32 pp., illus., processed, Chesapeake Bay Institute, The Johns Hopkins University, Baltimore, Md., January 1957.

ECHO-SOUNDING:

Detection of Fish--Echo Sounding, by D. H. Cushing and I. D. Richardson, *Fishery Investigations* 1955, Series 2, No. 1, printed, Ministry of Agriculture and Fisheries, Chester Terrace, Regents Park, N.W.1, England, 1955. Describes investigations carried out with a triple-frequency echo-sounder for the detection of fish.

FISH CULTURE:

Some Aspects of the Problem of Rearing Marine Fishes, by Robert W. Morris, *Bulletin de l'Institut Oceanographique* No. 1082, 64 pp., illus., printed, Musee Oceanographique (Bulletin), Monaco-Ville (Pte), France, July 25, 1956.

FISHERIES EDUCATION:

Educacion Pesquera en Noruega (Fisheries Education in Norway), by Sven Somme, 76 pp., illus., printed, FAO Regional Office, Food and Agriculture Organization of the United Nations, Santiago, Chile.

FISH STICKS:

"Infra-Red Cooking of Fish Sticks," article, *Canner and Freezer*, vol. 123, p. 35, December 24, 1956, printed, Clissold Publishing Co., 105 W. Adams St., Chicago 3, Ill. Describes the cooking of fish sticks by infra-red heat at a plant in Wheatley, Ontario, Canada.

FREEZING:

Post-Mortem Changes in the Lenses of Fish Eyes. II--Effects of Freezing, and Their Usefulness in Determining the Past History of the Fish, by R. M. Love, *DSIR Food Investigation Memoir* No. 1023, 7 pp., illus., printed, (Reprinted from *Journal of the Science of Food and Agriculture*, no. 3, 1956, pp. 220-226.) Torry Research Station, Department of Scientific and Industrial Research, Aberdeen, Scotland.

GEAR:

The Lampara Net in Turkish Waters (A Report from the Fishery Research Center, Meat and Fish Office), by Olav Aasen, Ilham Artuz, and Erdogan Akyuz, *Series Marine Research* vol. 1, no. 3, 19 pp., illus., printed in English with summary in Turkish. Fakulteler Matbaasi, Istanbul, Turkey, 1956.

GENERAL:

Man Under the Sea, by James Dugan, 332 pp., illus., printed, Harper & Brothers, 49 East 33rd St., New York 16, N. Y., 1956. A history of the courageous men who have pioneered, developed, and advanced undersea exploration from 415 B.C. to 1955. The author presents vivid stories of diving history, salvage, diving physiology, free diving, undersea warfare, submarine vehicles, underwater photography, oceanography, undersea archeology, and the deepest descents into the sea. This colorful history is enhanced by a generous amount of photographs and sketches. A list of the principal events in underwater history from 415 B.C. to 1955 and an undersea bibliography are included as appendices.

Names of Fishes and Charts of Statistical Areas, 9 pp., illus., printed, (Reprinted from *Bulletin Statistique*, International Council for the Study of the Sea.) Imprimerie Bianco Lunos A/S, Copenhagen, Denmark.

Salt-Water Angling, by Michael Kennedy, 376 pp., illus., printed, Pitman Publishing Corporation, New York, N. Y., 1956. Deals with present-day sea angling. Discusses tackle and fishing methods; baits and practical fishlore; seamanship; and weather wisdom. The finer forms of sea angling and modern developments in equipment are fully covered.

GREENLAND:

"Fisket ved Vest-Grønland, 1956" (Fishing off West Greenland, 1956), by Knut Friis, article, *Fiskets Gang*, no. 19, May 9, 1957, pp. 249-253, illus., printed in Norwegian. *Fiskets Gang*, Postgiro nr. 691-81, Bergen, Norway. Describes the operations of 71 long liners and 2 trawlers off West Greenland. Presents statistics on the sizes of the vessels as well as detailed data on the type of gear used. Landings of salted cod, frozen halibut, salted cusk, and frozen redfish made by the vessels are also given.

HALIBUT:

"Contribution to the Life History of the Halibut at the West of Iceland in Recent Years (1936-1950)," by Adalsteinn Sigurdsson, article, *Meddelelser fra Danmarks Fiskeri- og Havundersøgelse*, Ny Serie Bind I, Nr. 16, 24 pp., illus., printed, C. A. Reitzels Forlag, Copenhagen, Denmark, 1956.

IMPORTS:

Schedule A--Statistical Classification of Commodities Imported into the United States, January 1, 1954, Edition, revised and reprinted July 1, 1957, printed, \$3.50 domestic and \$4.50 foreign. Foreign Trade Division, Bureau of the Census, U.S.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Department of Commerce, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.) Schedule A is the statistical classification of commodities imported into the United States used in compiling the official United States import statistics. It shows for each commodity description (including fishery products and related commodities) the commodity code numbers to be shown on import entries and withdrawal forms. In addition it shows the country, customs district, subgroup, economic class, unit of quantity, and flag of vessel classifications used in compiling the statistics. The January 1, 1954, edition corrected to July 1, 1957, superseding the original issue of the January 1, 1954, edition, is printed in looseleaf form. The cost of the Schedule includes supplemental bulletins and pages to keep it up to date for at least a year from the time of issuance.

NORTH CAROLINA:

Commercial Fisheries of North Carolina--An Economic Analysis, by George M. Woodward, 163 pp., illus., printed, \$2. Bureau of Business Services and Research, School of Business Administration, University of North Carolina, Chapel Hill, N. C., 1956. Describes a study that has expanded, supplemented, and brought up to date previous economic research on the marine fisheries of North Carolina. The objectives of the study are: (1) to measure and assess the importance of commercial fishing in North Carolina; (2) to determine the rates of growth of the fisheries and the economic factors affecting these rates; and (3) to discover what economic advantages North Carolina has in the production of sea products. This book is divided into the five following parts, each of which is thoroughly covered: "Overview of the Fishing Industry--The Perspective and Setting"; "The Economic Outlook for the Finfisheries"; "The Oyster Fishery"; "The Shrimp Fishery"; and "Processing of Fishery Products." Many tables and charts and a technical appendix are included.

OYSTERS:

"Effect of Aureomycin Chlortetracycline in the Processing and Storage of Freshly Shucked Oysters," by Anthony Abbey, A. Richard Kohler, and Sidney D. Upham, article, *Food Technology*, vol. 11, no. 5, May 1957, pp. 265-271, illus., printed, single copies of periodical: domestic US\$1.50, foreign US\$1.75. (Published by the Institute of Food Technologists.) The Garrard Press, 119 West Park Ave., Champaign, Ill. A review of the literature and extensive experiments in prolonging the freshness of fish with antibiotics is given. The efficacy of antibiotics for maintaining freshness in shucked oysters has not been as well established as in fish. The present report evaluates the use of aureomycin chlortetracycline (CTC) in the processing of freshly-shucked oysters. The data presented indicate that shucked oysters treated with CTC remain organoleptically acceptable for longer storage periods when compared to the untreated controls. CTC was evaluated in concentrations ranging from 1 p.p.m. to 30 p.p.m. with varying exposure times. Several trials were conducted in cooperation with commercial processors. On a limited basis, production facilities

and schedules were employed wherever practical; the various proportions of freshly-shucked oysters and the treating solutions as well as exposure times were thus investigated. Comparatively unfavorable storage conditions were usually employed for the laboratory freshness studies. Under these conditions, the microbial counts and organoleptic findings indicated the usefulness of CTC in the processing of freshly-shucked oysters.

Relative Intensity of Oyster Setting in Different Years in the Same Areas of Long Island Sound,

by V. L. Loosanoff and C. A. Nomejko, 6 pp., illus., printed. (Reprinted from *Biological Bulletin*, vol. 111, no. 3, December 1956, pp. 387-392.) Marine Biological Laboratory, Woods Hole, Mass. Discusses studies of variations in the intensity of setting of the *Crassostrea virginica* oyster in ten chosen areas over a twelve-year period--from 1944 through 1955.

PILCHARD:

The South African Pilchard (SARDINOPS OCELE-LATA) Migration, 1950-55, by D. H. Davies, Division of Fisheries Investigational Report No. 24, 52 pp., illus., printed. (Reprinted from *Commerce and Industry*, November 1956.) Division of Fisheries, Beach Rd., Sea Point, Cape Town, Union of South Africa.

PRESERVATION:

Antibiotic Tests were Successful (Experiments with Aureomycin Ice to Continue), by J. M. Shewan, DSIR Food Investigation Misc. Paper No. 17/56, printed. (Reprinted from *Fishing News*, Aug. 10, 1956.) Torry Research Station, Department of Scientific and Industrial Research, Aberdeen, Scotland.

Heat and Water Transfer During the Dehydration of Herring Fillets, by M. M. del Campo and C. L. Cutting, DSIR Food Investigation Memoir No. 1026, 8 pp., illus., printed. (Reprinted from *Journal of the Science of Food and Agriculture*, 1956, no. 6, pp. 417-424.) Department of Scientific and Industrial Research, Torry Research Station, Aberdeen, Scotland.

Smoke-Curing Salmon and Trout in the Torry Controlled Kiln, by C. T. House and C. L. Cutting, DSIR Food Investigation Memoir No. 1027, 10 pp., illus., printed. (Reprinted from *Food Manufacture*, vol. XXXI, 1956, pp. 427-436.) Department of Scientific and Industrial Research, Torry Research Station, Aberdeen, Scotland.

"Uptake of Aureomycin Chlortetracycline by Fish and Its Heat Inactivation," by Tetuo Tomiyama, Yasuo Yone, and Kazuo Mikajiri, article, *Food Technology*, vol. 11, no. 5, May 1957, pp. 290-293, illus., printed, single copies of periodical: domestic US\$1.50, foreign US\$1.75. (Published by the Institute of Food Technologists.) The Garrard Press, 119 West Park Ave., Champaign, Ill. The purpose of this paper is to obtain more information on the uptake of aureomycin chlortetracycline (CTC) by several round fish and to study its distribution in fish muscle and its destruction by heat in fish muscle. Uptake, distribution, and heat destruction of CTC in four

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

species of round fish and in fish fillets were determined by a modified pad plate assay. CTC did not penetrate into the muscle tissue of round fish from chilled sea water containing 10 p.p.m. within one day of immersion except in the case of small fish with incompletely developed scales, e.g., pilchard, common mackerel. Determination of CTC in various parts of fresh round fish "isaki" which were stored in chilled sea water containing 10 p.p.m. of CTC gave results which indicated that the penetration of CTC into meat or viscera did not occur after 27 hours' storage whereas a measurable uptake did occur rather rapidly into the skin and gills. Evidence was obtained that the surface part of bonito muscle (without skin) picked up as much as 2.4 p.p.m. CTC over a 5-hour period when immersed in sea water containing 10 p.p.m. at 4° C., whereas no CTC was found in the muscle deeper than 10 mm. The rate of heat destruction in bonito muscle increased remarkably as the temperature was raised. The change in residual CTC can be expressed as an exponential function of time of heating.

SALMON:

(International Pacific Salmon Fisheries Commission) Collection and Interpretation of Sockeye Salmon Scales, by R. I. Clutter and L. E. Whitesel, Bulletin IX, 159 pp., illus., printed. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1956.

SARDINES:

Studies and Researches on the Manufacture of Canned Moroccan Sardines, by R. Meesmaecker and Y. Sohler, 105 pp., printed. Cah. Lab. Froid Cons. Ain-Sebaa, Casablanca No. 2, Morocco, 1956.

SHRIMP:

"Objective Tests Applicable to Quality Studies of Ice Stored Shrimp," by M. E. Bailey, E. A. Fieger, and A. F. Novak, article, Food Research, vol. 21, November-December 1956, pp. 611-620, printed. The Garrard Press, 119-123 West Park Ave., Champaign, Ill. A study made to demonstrate the effectiveness of various tests for evaluating the organoleptic quality of iced shrimp.

SWEDEN:

A Study Tour of Fishery Developments in Sweden, September 1955, by C. J. McGrath, 27 pp. of text, 40 pp. diagrams and photographs, processed. Department of Lands, Fisheries Branch, 3 Cathal Brugha Street, Dublin, Ireland. A report, largely pictorial, on a study of fish conservation measures adopted for salmon and trout in the river systems of Sweden. Discusses the solutions to problems posed by electrical power plants to migration and spawning of fish. Principal subjects covered are fishways, tagging experiments, ponds, and hatcheries.

TERRITORIAL WATERS:

España Pesquera (Fishing Spain), vol. II, no. 12, 40 pp., illus., printed in Spanish. Sindicato Nacional de Pesca, Paseo del Prado, 20, sexta planta, Madrid, Spain, January 1957. This issue is devoted almost exclusively to international fishery problems confronting the United Nations. Included, among others, are the following articles:

"The Codification of the Law of the Sea"; "The Territorial Sea and the Continental Shelf"; "The Future International Conference on the Law of the Sea--Intervention of Mr. Castro-Rial, Spain's Delegate to the U.N."; and "The Submarine Platform," by Jose Luis de Azcarraga.

(International Law Commission) Report of the International Law Commission on the Work of its Eighth Session: (a) Final Report on the Regime of the High Seas, the Regime of the Territorial Sea and Related Problems, A/C.6/L.388, December 21, 1956, 6 pp., processed. United Nations, International Law Commission, New York, N. Y. Presents the texts of "Principles of Mexico on the Juridical Regime of the Sea" and of the "Resolution of Ciudad Trujillo."

TRADE LIST:

The following foreign trade list has been issued by the Office of Economic Affairs, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C. Copies of the list may be purchased by firms in the United States at \$2 each from that office or from field offices of the Department.

Oils (Animal, Fish, and Vegetable)--Importers, Dealers, Producers, Refiners, and Exporters--Argentina, 10 pp. (April 1957). Contains the names and addresses, approximate daily production for producers, and type of product handled by each firm. Average annual consumption of edible oils is about 250,000 metric tons. Normally production is sufficient to supply domestic needs and provide a surplus for export. Some medicinal and occasional supplies of edible oils are imported whenever there is a decrease in domestic production. Imports of fish oils amounted to 89 metric tons from Norway during the first nine months of 1956.

TROPICAL FISH:

How to Keep and Breed Tropical Fish, by Dr. C. W. Emmens, 191 pp., illus., printed, T. F. H. Publications, Inc., T. F. H. Building, 57 Academy St., Jersey City 2, N. J., 1956.

TUNA:

(Inter-American Tropical Tuna Commission) Schooling Habits of Yellowfin Tuna (NEOTHUNUS MACROPTERUS) and Skipjack (KATSUWONUS PELAMIS) in the Eastern Pacific Ocean as Indicated by Purse-Seine Catch Records, 1946-1955, by Craig J. Orange, Milner B. Schaefer, and Fred M. Larmie, Bulletin vol. II, no. 3, 126 pp., illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif., 1957. A report, including 9 charts and 9 tables, on the results of investigations of the schooling habits of yellowfin and skipjack tuna. The report is based on logbook records kept by masters and fishermen of purse-seine fleet vessels. Yellowfin tuna is being fished at a greater intensity than skipjack. According to the authors, this report will be of particular interest in regard to formulating practical fishing regulations, limiting the catching of yellowfin without limiting the catching of skipjack, if it should become necessary.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

TURKEY:

A Contribution to the Fishery Investigations in the Sea of Marmara (A Report from the Fishery Research Center, Meat and Fish Office), by Olav Aasen, İham Artuz, and Erdogan Akyuz, Series Marine Research vol. 1, no. 2, 31 pp., illus., printed in English with summary in Turkish. Fakulteler Matbaası, Istanbul, Turkey, 1956.

Some Data Concerning the Fisheries in Iskenderun Bay, by Olav Aasen and Erdogan Akyuz, Series Marine Research vol. 1, no. 4, 20 pp., illus., printed in English with summary in Turkish. Fakulteler Matbaası, Istanbul, Turkey, 1956.

UNITED KINGDOM:

Herring Industry Board, Twenty-Second Annual Report for the Year Ended 31st December, 1956, 41 pp., printed. Herring Industry Board, 1 Glenfinlas Street, Edinburgh 3, Scotland, June 1957. Reports on the following phases of the British herring industry: the fishing; commercial and statutory matters concerning the Herring Industry Board, the catchers, and shore-based sections of the industry; marketing; research and development; the fleet; and accounts. Contains statistical tables showing the landings and value of catches and disposal of landings, during the winter, summer, and fall seasons; composition of fleets in the Irish Sea area and East Anglia; curing strength and production of cured herring; imports of fresh and frozen herring; disposal of the United Kingdom's total herring landings, excluding imports; and applications for grants and loans.

A summary of pertinent rules and directions issued in 1956 and notes on trawling for herring are included as appendices. The report as a whole particularly stresses that the proportion of younger fish in the catches has increased considerably in the last few years and that herring catches are becoming alarmingly smaller.

Scottish Sea Fisheries Statistical Tables, 1956, 46 pp., printed. Her Majesty's Stationery Office, 13a Castle Street, Edinburgh 2, Scotland, April 1957. Contains 23 statistical tables of the fish landed and cured, vessels and fishermen, and creek returns. Tables 1 through 16 cover quantity and value of fish landed by British and foreign vessels; landings of British vessels according to methods of fishing from 1938 through 1956; quantity, value, and average value of each kind of fish landed by British vessels in 1913, 1938, and 1949-1956; quantity and value of each kind of fish landed in specific districts by British vessels of various types; quantity of each kind of fish landed from and expenditure of fishing effort in each fishing region by British vessels; quantity of each kind of fish landed by foreign vessels from each fishing region and quantity and value of fish landed by each nationality; and seasonal landings of herring. Tables 17 through 23 cover quantity of herring cured from 1913 through 1956; quantity and value of whitefish cured and herring cured in each district, according to method of cure; fishing vessels; fishermen employed; greatest number of vessels and persons employed by districts in herring fishing; and vessels, fishermen, and quantity and value of fish landed in creeks.



INTERNATIONAL CODE FOR DESCRIBING THE STATE OF THE SEA

The internationally-recognized and commonly-used code for reporting the state of the sea is as follows:

Code Figure	Description of Sea	Height	
		Meters	Feet (approx.)
0	Calm-glassy	0	0
1	Calm-rippled	0 - 0.1	0 - $\frac{1}{2}$
2	Smooth-wavelets	0.1 - 0.5	$\frac{1}{2}$ - $1\frac{1}{2}$
3	Slight	0.5 - 1.25	$1\frac{1}{2}$ - 4
4	Moderate	1.25 - 2.5	4 - 8
5	Rough	2.5 - 4	8 - 13
6	Very rough	4 - 6	13 - 20
7	High	6 - 9	20 - 30
8	Very high	9 - 14	30 - 45
9	Phenomenal	over 14	over 45

In the October 1956 issue of Commercial Fisheries Review (p. 5), a different code was shown. However, we understand that the international code given above is more widely used and recognized.

CONTENTS (CONTINUED)

	Page		Page
FOREIGN (Contd.):		FOREIGN (Contd.):	
Brazil:		Republic of Korea:	
New Fish-Processing Plant To Be Established	50	New Fish Canneries to be Built by UNKRA	63
Canada:		Spain:	
Salmon Industry Labor-Management Dispute in British Columbia	51	Bilbao District Fisheries Trends, May 1957	63
Chile:		Vigo Fisheries Trends, April 1957	64
Whaling Factory Financed by Japanese Capital Authorized	51	United Kingdom:	
Cuba:		New Type Herring Trawlers from Poland	64
Closed Season For Mojarra and Spiny Lobster Ended	51	Sardine Canners Lower Prices to Meet Import Competition	64
Ecuador:		White Fish Exports to Russia Proposed to Offset Crab Meat Imports	65
New Decree Reduces License and Registration Fees and Permits Bait Fishing	52	FEDERAL ACTIONS:	
El Salvador:		Department of the Interior:	
Fisheries Trends, June 1957	52	Fur-Seal Convention Ratification Urged	67
German Federal Republic:		Interstate Commerce Commission:	
Canned Mackerel Market	53	Express Rate Increase on Fish and Shellfish in Eastern Territory Denied	67
Greece:		Department of State:	
Canned Mackerel and Jack Mackerel Market	55	U. S. Fishery Items Unaffected by Supplementary Trade Agreement with United Kingdom and the Benelux Countries	68
Iceland:		Treasury Department:	
Fisheries Trends, January-May 1957	57	Internal Revenue Service:	
Japan:		Rules That "Company Fishermen" Are Employees	68
Albacore Ex-Vessel Price Drops with Good Fishing Early in June	57	White House:	
Early Shipments of Canned Salmon Planned	57	United States Commissioner Appointed to North Pacific Fisheries Commission	68
Exports of Fishery Products, April 1957	58	Eighty-Fifth Congress (First Session)	69
North Pacific Salmon Mothership Fishery Catch Good	58	FISHERY INDICATORS:	
Mexico:		Chart 1 - Fishery Landings for Selected States	71
Fishery Research Institute Proposed by Fishing Industry Import and Export Duties on Fishery Items Revised	59	Chart 2 - Landings for Selected Fisheries	72
New Fish-Processing Plant	60	Chart 3 - Cold-Storage Holdings and Freezings of Fishery Products	73
Pacific Coast Shrimp Price Dispute Settled	60	Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers	74
Morocco:		Chart 5 - Fish Meal and Oil Production - U. S. & Alaska	74
Trade Exchanges with East Germany Include Fishery Products Exports	61	Chart 6 - Canned Packs of Selected Fishery Products	75
Norway:		Chart 7 - U. S. Fishery Products Imports	76
Cod Fisheries Trends as of May 11, 1957	62	RECENT FISHERY PUBLICATIONS:	
Pakistan:		Fish and Wildlife Service Publications	77
Fishing Industry to be Developed from U. S. Grant	62	Miscellaneous Publications	78
Republic of the Philippines:			
Import Duties on Canned Fish Lowered	62		



Editorial Assistant--Ruth V. Keefe

Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, Helen Joswick, and Helen Turner

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Pages 27-28--Exploratory Fishing and Gear Development Section,
Branch of Commercial Fisheries, U. S. Fish and Wildlife Service.
Page 30--Woods Hole Laboratory, Woods Hole, Mass.



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NATIONAL FISH WEEK--"FISH PARADE"--SEPTEMBER 18-28

**FISH-SHELLFISH
TASTE SO GOOD
COST SO LITTLE**



SPECIAL TO-DAY

The Fishing Industry's all-out promotion channeled over radio, television, newspapers, magazines, and other media takes place this year on September 18-28. The many advantages in serving fish are being stressed. Many appetizing new fish dishes are being featured. All types of fresh, frozen, canned, smoked, precooked, cured, and fishery products and fish dinners will be advertised. Every effort is being made to get retail stores to display, stock, and promote fishery products during "Fish Parade" and the months that follow.

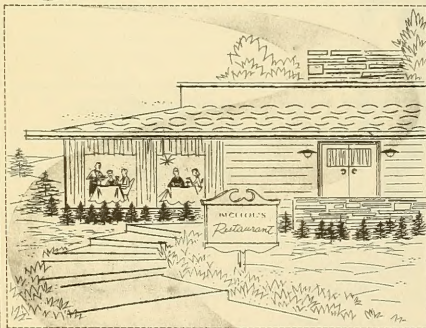
**OUR DISHES OF
FISHES ARE SIMPLY
DELICIOUS**



TRY ONE OF TODAY'S TEMPTING SEAFOOD ENTRÉES

More profits from

Glamorous Fish Dishes



Plan now for the Fish Parade—September 18-28

The FISH PARADE will soon be in full swing. It's the fall promotion planned to increase your fish and shellfish orders. So remember the dates in order to plan your own profitable tie-in.

The full power of the press, radio and television will be used to remind your customers that fish is delicious and healthful... that there is great variety to suit every taste. And your own operation can be speeded up because fish is so easy to prepare.

This all-out promotion to increase interest in delectable fish dishes can only result in stepped-up fishery product orders... more satisfied guests. And it's easy to get your fair share of the new business on this high mark-up item.

Ask your dealer for the merchandising material for this profit-making program. Promote fishery products—carry them on your menu during Fish Parade Week and the months ahead.

TIE IN FOR EXTRA PROFITS

Big, new sales opportunities



Plan now for the

Fish Parade

September 18-28

The Fish Parade will soon be in full swing. It's the fall promotion planned to increase your fishery product sales. So remember the dates in order to plan your own profitable tie-in.

The full power of the press, radio and television will be used to tell millions of housewives about the many advantages in serving fish. They'll see many appetizing new fish dishes. They'll hear and read about fresh, frozen, canned, smoked, precooked, cured, and all types of fishery products.

This all-out promotion to increase interest in fish can only result in stepped-up sales. And it's easy to get your fair share of the new business on this high mark-up item.

Ask your dealer for the merchandising material on this profit-making program. Display, stock, promote fishery products during the Fish Parade and in the months ahead.

TIE-IN FOR EXTRA SALES